MDS-PC1

SERVICE MANUAL

Self Diagnosis Supported model

US Model
AEP Model
UK Model
E Model

US and foreign patents licensed from Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism	MDS-S38
MD Mechanism Type	MDM-3B
Optical Pick-up Type	KMS-260A/J1N

SPECIFICATIONS

System	MiniDisc digital audio system
Disc	MiniDisc
Laser	Semiconductor laser (λ = 780 nm) Emission duration: continuous
Laser output	Less than 44.6 µW* * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.
Laser diode properties	Material: GaAlAs
Revolutions (CLV)	400 r/min to 900 r/min
Error correction	Advanced Cross Interleave Reed Solomon Code (ACIRC)
Sampling frequency	44.1 kHz
Coding	Adaptive Transform Acoustic Coding (ATRAC)
Modulation system	EFM (Eight-to-Fourteen Modulation)
Number of channels	2 stereo channels
Frequency response	5 to 20,000 Hz ±0.3 dB
Signal-to-noise ratio	Over 96 dB during playback
Wow and flutter	Below measurable limit

Inputs

	Jack type	Input impedance	Rated input	Minimum input
LINE (ANALOG) IN	Phono jacks	47 kilohms	500 mVrms	125 mVrms
DIGITAL IN	Square optical connector jack	Optical wave length: 660 nm	—	—

Outputs

	Jack type	Rated output	Load impedance
PHONES	Stereo phone jack	28 mW	32 ohms
LINE (ANALOG) OUT	Phono jacks	2 Vrms (at 50 kilohms)	Over 10 kilohms
DIGITAL OUT	Square optical connector jack	–18 dBm	Optical wave length: 660 nm

General

Power requirements

Where purchased	Power requirements
Continental Europe and UK	220 – 230 V AC, 50/60 Hz
Other countries	110 – 120, 220 – 240 V AC, 50/60 Hz
US	120 V AC, 60 Hz

— Continued on next page —

MINIDISC DECK

MICROFILM

SONY®

Power consumption 20 W

Dimensions (approx.) (w/h/d) incl. projecting parts and controls
280 × 90 × 287 mm

Mass (approx.) 2.8 kg

Supplied accessories

- Audio connecting cords (2)
- Optical cable (1)
- Remote commander (remote) RM-D23M (1)
- Sony R6 (size-AA) batteries (2)
- Connector* (RS-232C←→monaural mini-jack) (1)
- CONTROL A1 connecting cord* (1)
- CD-ROM* (1)

* Required for operation by personal computer. For details on hooking up and operation, please refer the operating instructions supplied with the MD editor software.

Design and specifications are subject to change without notice.

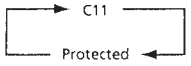
SELF-DIAGNOSIS FUNCTION

The self-diagnosis function consists of error codes for users which are displayed automatically when errors occur, and error codes which show the error history in the test mode during servicing. For details on how to view error codes for users, refer to the following box in the instruction manual. For details on how to perform checks during servicing, refer to the following "Procedure for Using the Self-Diagnosis Function (Error History Display Mode)".

Self-Diagnosis Function

The deck has a self-diagnosis display. This function shows a three-digit display (a combination of a letter and figures) and the corresponding message alternately, so you can check the deck's condition.
If such a display appears, check the following table in order to resolve the problem.
Should any problem persist, consult your nearest Sony dealer.

Self-diagnosis display



Three-digit display/Message	Cause/Remedy
C11/Protected	The inserted MD is record-protected. ➡ Take out the MD, and close the record-protect tab (page 9).
C13/REC Error	The recording was not made properly. ➡ Set the deck in a stable place, and repeat the recording procedure.
	The inserted MD is dirty (with smudges, fingerprints, etc.), scratched, or not up to standards. ➡ Replace the disc, and repeat the recording procedure.
C13/Disc Error	The deck could not read the TOC of the MD properly. ➡ Take out the MD, and insert it again.
C14/Disc Error	The deck could not read the TOC of the MD properly. ➡ Insert another disc. ➡ If possible, erase all tracks on the MD using the All Erase Function on page 28.
C71/Check OPT-IN	A moment's lighting is due to the signals of the digital program being recorded. This does not affect the recorded material.
	While recording from a digital component connected through the digital input connector, the digital connecting cable was unplugged or the digital component turned off. ➡ Connect the cable or turn the digital component back on.

Procedure for Using the Self-Diagnosis Function (Error History Display Mode)

Note: Perform the self-diagnosis function in the "error history display mode" in the test mode. The following describes the least required steps. Be careful not to enter other modes by mistake. If other modes are set accidentally, press the EDIT/NO button to exit that mode.

1. While pressing the AMS dial, connect the power plug to the outlet, and release the AMS dial.
2. Rotate the AMS dial until "ERR DP MODE" is displayed.
3. Pressing the YES button sets the error history mode and displays "total rec".
4. Select the contents to be displayed or executed using the AMS dial.
5. Pressing the AMS dial displays or executes the contents selected.
6. Pressing the AMS dial another time returns to step 4.
7. Pressing the EDIT/NO button displays "ERR DP MODE" and exits the error history mode.
8. To exit the test mode, set the TIMER knob to "OFF", and press the I/⏻ button. The unit sets into the STANDBY state, and the test mode ends.

ITEMS OF ERROR HISTORY MODE ITEMS AND CONTENTS

Selecting the Test Mode

Display	Details of History
total rec	Displays the recording time in the form of "r□□□□□□h". The displayed time is the total number of hours the laser is high power, which is about one-fourth of the actual recording time. The time is displayed in decimal digits between 0h and 65535h.
total play	Displays the playback time in the form of "p□□□□□□h". The displayed time is the total actual play time. The paused time is not counted. The time is displayed in decimal digits between 0h and 65535h.
retry err	Displays the total number of retries during recording and retry errors during playback in the form of "r□□p□□". r indicates the retries during recording while p indicates the retry errors during playback. The number of retries is displayed in hexadecimal digits between 00 and FF.
total err	Displays the total number of errors in the form of "total□□". The number of errors is displayed in hexadecimal digits between 00 and FF.
err history	Displays the 10 latest errors in the form of "0□ E@@". The □ indicates the history number. The smaller the number, the newer is the error. (00 is the latest error.) The @@ indicates the error code. Refer to the following table for details. Rotate the AMS dial to switch the error history.
er refresh?	Mode which erases all the error histories. The error history serves as a reference for when to replace the optical pick-up. Perform this procedure when the optical pick-up has been replaced in order to erase past error histories and not at other times. Press the YES button when "er refresh??" is displayed. The history will be erased and "Complete!" will be displayed momentarily. Be sure to check the following when this mode has been executed. *Check that the data has been erased. *Perform recording and playback, and check that the mechanism operates normally.

Table of Error Codes

Error Code	Details of Error	Error Code	Details of Error
E00	No error	E05	FOK has deviated
E01	Disc error. Cannot read PTOC (Disc is ejected out)	E06	Unfocused (Servo has deviated)
		E07	Recording retry
E02	Disc error. UTOC error (Disc is not ejected out)	E08	Recording retry error
		E09	Play retry error (Access error)
E03	Loading error		
E04	Cannot read address (Servo has deviated)	E0A	Playback retry error (C2 error)

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacturer.
Discard used batteries according to manufacture's instructions.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

ADVARSEL

Eksplosjonsfare ved feilakting skifte av batteri.
Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten.
Brukte batterier katterier kasseres i henhold til fabrikantens

VARNIG

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en likvärdig typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt gällande föreakrifter.

VAROITUS

Parist voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.
ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSAETTELSE FOR STRÅLING.
VORSICHT : UNSICHTBARE LASERSTRAHLUNG. WENN ABDECKUNG GEÖFFNET UND SICHEREITSVERRIEGELUNG ÜBERBRÜCKT. NICHT DEM STRAHL AUSSETZEN.
VARO! : AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING : OSYNLING LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVERSEL : USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VIGYAZAT! : A BURKOLAT NYITÁSAKOR LÁTHATATLAN LÉZERSUGÁRVESZÉLY! KERÜLJE A BESUGÁRZÁST!

This caution label is located inside the unit.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

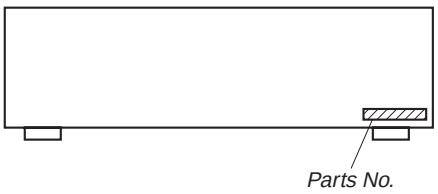
Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270˚C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

MODEL IDENTIFICATION
— BACK PANEL —



PARTS No.	MODEL
4-996-315-1☐	Singapore model
4-996-315-2☐	AEP, UK model
4-996-315-3☐	US model

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE

The AC leakage from any exposed metal part to earth Ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

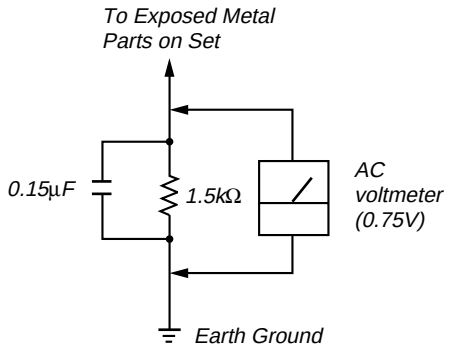


Fig. A. Using an AC voltmeter to check AC leakage.

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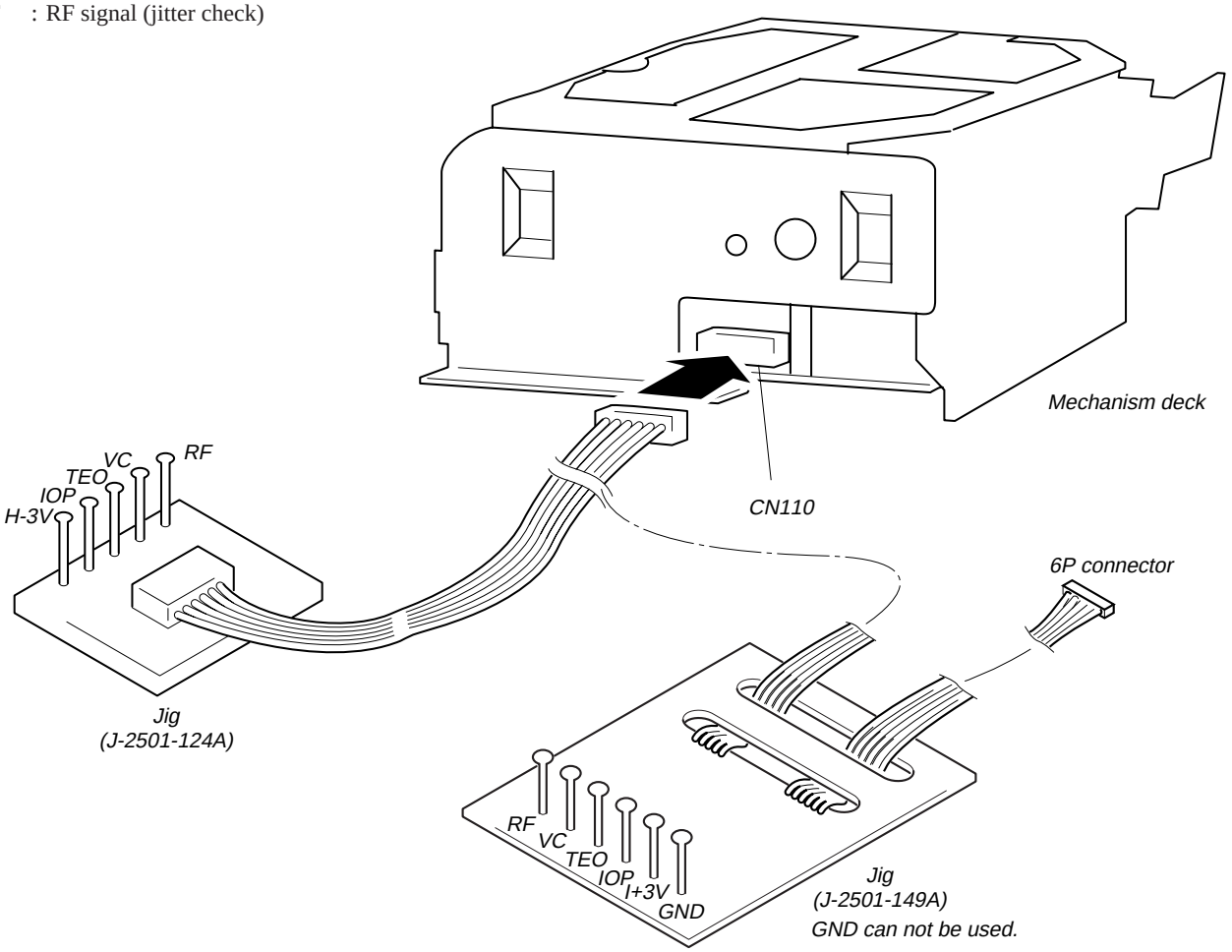
SECTION 1
SERVICING NOTE

BD BOARD WAVEFORM CHECK TOOL

Use the jig (J-2501-124-A or J-2501-149-A) to facilitate the checking of the waveform of the BD board. The names and check items of each terminal are as follows.

I+3V : For measuring the IOP (check if the optical pick-up laser has weakened)
IOP : For measuring IOP (check if the optical pick-up laser has weakened)
TEO : TRK error signal (traverse adjustment)
VC : Reference level for checking signals
RF : RF signal (jitter check)

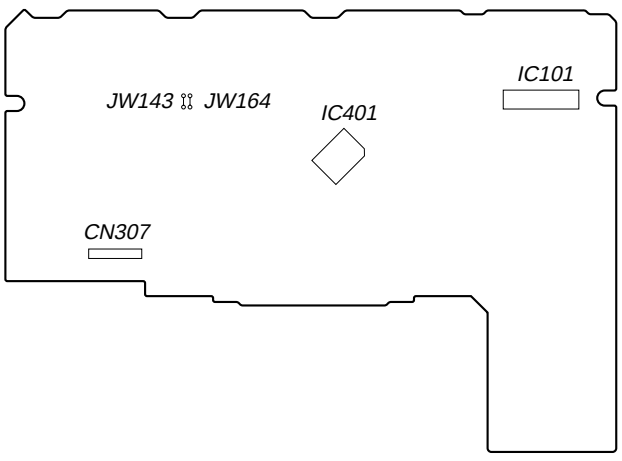


[FORCED RESET]

Perform forced reset if the unit does not operate normally due to the hangup of the microprocessor.
It is recommended that this be performed when the test mode and retry cause display mode cannot be exited, or when the unit does not operate normally when reassembled after being disassembled.

Method:Disconnect the power plug from the outlet, short-circuit the JW143 and 164 (RESET) of the MAIN board using a pair of tweezers, and discharge the backup battery.

[MAIN BOARD] (Component Side)



RETRY CAUSE DISPLAY MODE

* In this test mode, the causes for retry of the unit during recording and stop can be displayed on the fluorescent display tube. During playback, the "track mode" for obtaining track information will be set.
  This is useful for locating the faulty part of the unit.
* The following will be displayed:
  During recording and stop :Retry cause, number of retries, and number of retry errors.
  During playback :Information such as type of disc played, part played, copyright.
  These are displayed in hexadecimal.

Procedure:

1. Load a recordable disc whose contents can be erased into the unit.
2. Press the [MENU/NO] button. When "Edit Menu" is displayed on the fluorescent display tube, rotate the [AMS] dial to display "All Erase?".
3. Press the [YES] button. (Or press the [AMS] dial)
4. When "All Erase??" is displayed on the fluorescent display tube, the music calendar number blinks.
5. Press the [YES] button to display "Complete!!", and press the [■] button immediately. Wait for about 15 seconds while pressing the button. (The [AMS] dial can be pressed instead of the [YES] button for the same results.)
6. When the "TOC" displayed on the fluorescent display tube goes off, release the [■] button.
7. Press the [●REC] button to set the recording standby state. Then press the [▷II] button to start recording.
8. Press the [DISPLAY/CHAR] button and check the test mode display (Fig. 1).
9. To check the "track mode", press the [▷II] button to start play. Then press the [DISPLAY/CHAR] button to display the test mode display (Fig. 2), and check the display.
10. To exit the test mode, press the [I/⏻] button to turn OFF the power. When "TOC" disappears, disconnect the power plug from the outlet. If the test mode cannot be exited, refer to "Forced Reset" on page 5.

Fig. 1 Reading the Test Mode Display (During recording and stop)

[RTs@@c##e**]
Fluorescent display tube display

@@: Cause of retry
: Number of retries
** : Number of retry errors

Fig. 2 Reading the Test Mode Display (During playback)

[@@####** $$]
Fluorescent display tube display

@@: Parts No. (name of area named on TOC)
: Cluster
** : Sector } Address (Physical address on disc)
$$: Track mode (Track information such as copyright information of each part)

Reading the Retry Cause Display

	Higher Bits				Lower Bits				Hexa-decimal	Cause of Retry	Occurring conditions
Hexadecimal	8	4	2	1	8	4	2	1			
Bit	b7	b6	b5	b4	b3	b2	b1	b0			
Binary	0	0	0	0	0	0	0	1	01	shock	When track jump (shock) is detected
	0	0	0	0	0	0	1	0	02	Discontinuous address	When ADIP address is not continuous
	0	0	0	0	0	1	0	0	04	ader5	When ADER was counted more than five times continuously
	0	0	0	0	1	0	0	0	08	DIN unlock	When DIN unlock is detected
	0	0	0	1	0	0	0	0	10	FCS incorrect	When not in focus
	0	0	1	0	0	0	0	0	20	IVR rec error	When ABCD signal level exceeds the specified range
	0	1	0	0	0	0	0	0	40	CLV unlock	When CLV is unlocked
	1	0	0	0	0	0	0	0	80	Access fault	When access operation is not performed normally

Reading the Display:
Convert the hexadecimal display into the binary display. If more than two causes, they will be added.

Example
When 44 is displayed:
Upper bit : 4=0100 ⟶ b6
Lower bit : 4=0010 ⟶ b2
In this case, the retry cause is combined of “CVL unlock” and “ader5”.

When A4 is displayed:
Upper bit : A=1010 ⟶ b7+b5
Lower bit : 4=0010 ⟶ b2
The retry cause in this case is combined of “access fault”, “IVR rec error”, and “ader5”.

Reading the Track Mode Display

	Higher Bits				Lower Bits				Hexa-decimal	Details	
Hexadecimal	8	4	2	1	8	4	2	1			
Bit	b7	b6	b5	b4	b3	b2	b1	b0		When 0	When 1
Binary	0	0	0	0	0	0	0	1	01	Emphasis OFF	Emphasis ON
	0	0	0	0	0	0	1	0	02	Monaural	Stereo
	0	0	0	0	0	1	0	0	04	This is 2-bit display. Normally 01.	
	0	0	0	0	1	0	0	0	08	01:Normal audio. Others:Invalid	
	0	0	0	1	0	0	0	0	10	Audio (Normal)	Invalid
	0	0	1	0	0	0	0	0	20	Original	Digital copy
	0	1	0	0	0	0	0	0	40	Copyright	No copyright
	1	0	0	0	0	0	0	0	80	Write prohibited	Write allowed

Reading the Display:
Convert the hexadecimal display into the binary display. Several cause are added and displayed.

Example
When 84 is displayed:
Upper bit : 8=1000 ⟶ b7
Lower bit : 4=0100 ⟶ b2
In this case, as b2 and b7 are 1 and others are 0, the cause is combined of “Emphasis OFF”, “Monaural”, “Original”, Copyrighted” and “Write permitted”.

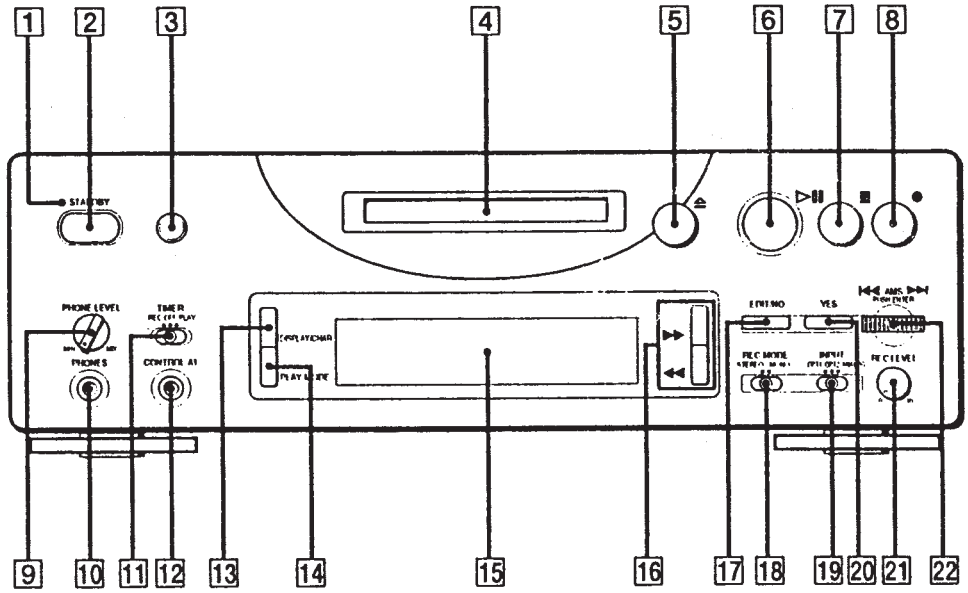
When 07 is displayed:
Upper bit : 0=0000 ⟶ all 0
Lower bit : 7=0111 ⟶ b0+b1+b2
In this case, as b0, b1, and b2 are 1 and others are 0, the cause is combined of “Emphasis ON”, “Stereo”, “Original”, Copyrighted” and “Write prohibited”.

Hexadecimal/Decimal Conversion Table

Hexadecimal	Binary	Hexadecimal	Binary
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111

SECTION 2
GENERAL

Front Panel



Location of Parts and Controls

1 STANDBY lamp
2 I/⏻ (Power) switch
3 Remote sensor
4 DISK compartment
5 ⏏ button
6 ▷II button
7 ■ button
8 ● button
9 PHONE LEVEL knob
10 PHONES jack
11 TIMER switch
12 CONTROL A1 jack
13 DISPLAY/CHAR button
14 PLAY MODE button
15 DISPLAY window
16 ◀◀/▶▶ button
17 EDIT/NO button
18 REC MODE switch
19 INPUT switch
20 YES button
21 REC LEVEL knob
22 AMS dial

• AMS is the abbreviation for Automatic Music Sensor.

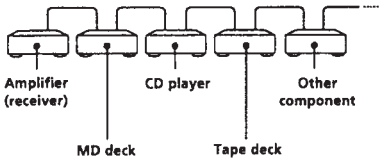
About the CONTROL A1 Control System

This MD deck is compatible with the CONTROL A1 Control System.
The CONTROL A1 Control System was designed to simplify the operation of audio systems composed of separate Sony components. CONTROL A1 connections provide a path for the transmission of control signals which enable automatic operation and control features usually associated with integrated systems.
Currently, CONTROL A1 connections between a Sony MD deck, CD player, amplifier (receiver), and cassette deck provide automatic function selection and synchronized recording.
In the future the CONTROL A1 connection will work as a multifunction bus allowing you to control various functions for each component.

Note
The CONTROL A1 Control System is designed to maintain upward compatibility as the Control System is upgraded to handle new functions. In this case, however, older components will not be compatible with the new functions.

Connecting the CONTROL A1 Control System

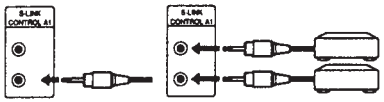
Connecting a CD player, etc.
Connect the CONTROL A1 cables in series to the CONTROL A1 jacks on the back of each component. Be sure to connect a CONTROL A1 compatible amplifier (receiver) to take advantage of the automatic function selection feature.



- The components can be connected in any order.
- You can connect up to ten CONTROL A1 compatible components.
- The CONTROL A1 functions will work when the component you want to operate is turned on, even if all of the connected components are not turned on.
- As a rule, the CONTROL A1 remote control system should not incorporate more than one of each type of component (i.e., 1 MD deck, 1 CD player, 1 tape deck and 1 receiver). You may, however, be able to connect more than one of certain CD players*. Refer to the operating instructions supplied with the respective component for details.

* When a personal computer is connected, only connect one CD player to the deck and set that CD player's command mode to "1".

About the CONTROL A1 cable
- Use a commercially available 2P (mono) mini-plug cable less than 2 meters (78 3/4 in) long, with a maximum outer diameter no greater than 11 mm (7/16 in), and no resistance. Some CONTROL A1 compatible components are supplied with a CONTROL A1 cable as an accessory.
- If a component has more than one CONTROL A1 jack, you can use either one, or connect a different component to each jack.



"S-LINK" is a general name for Sony's Bus System, and includes the CONTROL A1 Control System.

Connecting a personal computer
Connect the CONTROL A1 jack on the front (or back) of the deck using the CONTROL A1 cable (supplied) and connector (supplied). Refer to the operating instructions supplied with the MD editor software for details.

Basic Functions of the CONTROL A1 Control System

Automatic function selection

When you connect CONTROL A1 compatible Sony components using CONTROL A1 cables, the function selector on the amplifier (or receiver) automatically switches to the correct input when you press the play button on one of the connected components.
(If you press ▷ (play button) on the MD deck while the CD is playing, the function selector on the amplifier switches from CD to MD.)

Notes
- This function only works when the components are connected to the amplifier (or receiver) inputs according to the names on the function buttons. Certain receivers allow you to switch the names of the function buttons. In this case, refer to the operating instructions supplied with the receiver.
- When recording, do not play any components other than the recording source. It will cause the automatic function selection to operate.

Synchronized recording

This function lets you conduct synchronized recording between the MD deck and selected source component.

1 Set the source selector on the amplifier (or receiver) to the source component.

2 Set the source component to pause mode (make sure both the ► and II indicators light together).

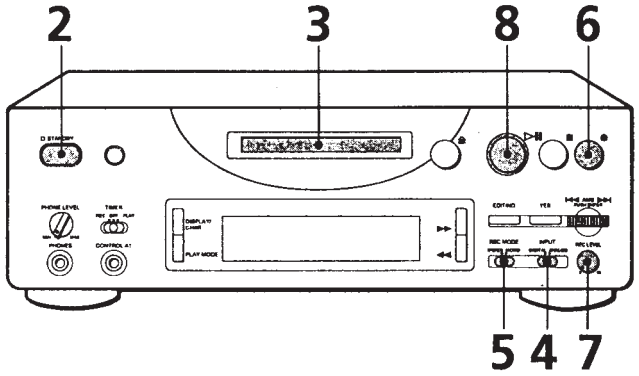
3 Set the deck to recording pause mode.

4 Press ▷II on the deck.
The source component is released from the pause mode, and recording begins shortly thereafter. When playback ends from the source component, recording stops.

Notes
- Do not set more than one component to the pause mode.
- Do not connect the headphones to the CONTROL A1 jack on the front panel. It may cause the noise from the headphones or malfunction of the deck.

This section is extracted from instruction manual.

Recording on an MD



When "REMOTE" appears in the display

The deck is set to be operated from the connected personal computer. You cannot operate the deck from the buttons on the front panel or remote.
To use the buttons on the front panel or remote, quit the MD editor application, turn off the deck, then turn it back on.

Note for European models

Be sure to set MAIN POWER on the rear of the unit to ON before using the unit.

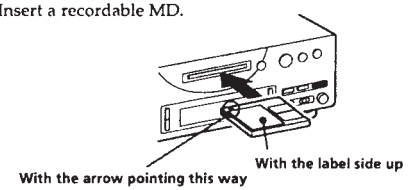
Monitor audio during recording

Even if you set REC MODE to MONO, the monitor signal does not become monaural.

1 Turn on the amplifier and play the program source you want to record.

2 Press I/⏻.
The STANDBY indicator turns off.

3 Insert a recordable MD.



If the MD has a recorded material on it, the deck will automatically start recording from the end of the last recorded track.

4 Set INPUT to the corresponding input connector.

To record through	Set INPUT to
DIGITAL IN	DIGITAL
LINE (ANALOG) IN	ANALOG

5 Set REC MODE to the mode you want to record in.

To record in	Set REC MODE*1 to
Stereo sound	STEREO
Monaural sound*2	MONO

*1 If you switch REC MODE during recording or recording pause, recording stops.
*2 In the monaural recording, you can record about two times longer than in the stereo recording.

When "TOC Writing" flashes in the display

The deck is currently updating the Table Of Contents (TOC). Do not move the deck or pull out the AC power cord. Changes to an MD made through recording are saved only when you update the TOC by ejecting the MD or changing the deck to standby by pressing the I/⏻ switch.

6 Press ●.
The deck becomes ready to record.

7 If you set INPUT to ANALOG in step 4, use REC LEVEL to adjust the recording level.
4 is satisfactory for most purposes.
For more precise adjustment, see page 14.

8 Press ▷II (or ▷).
Recording starts.

9 Start playing the program source.

Do not disconnect the deck from the power source immediately after recording

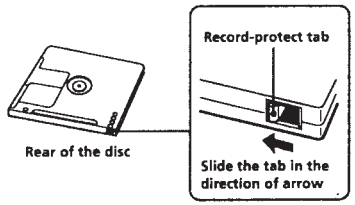
If you do, recorded material may not be saved to the MD. To save the material, after recording, press ⏏ to take out the MD or change the deck to standby by pressing I/⏻. "TOC Writing" will flash in the display at this time.
After "TOC Writing" stops flashing and goes out, you can pull out the AC power cord.

To	Press
Stop recording	■
Pause recording*	▷II (or II). Press the button again to resume recording.
Take out the MD	⏏ after stopping

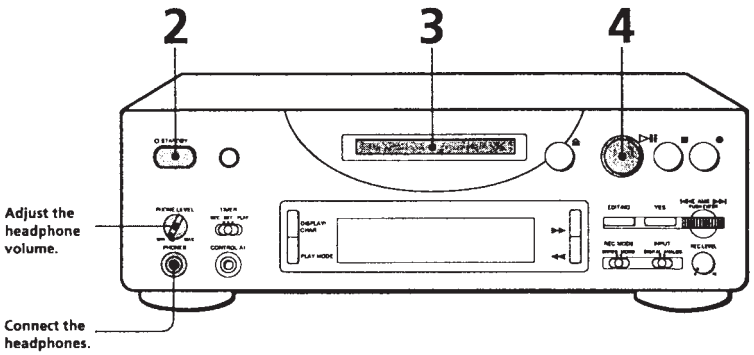
* Whenever you pause recording, the track number increases by one. For example, if you paused recording while recording on track 4, the track number increases by one and recording continues on the new track when restarted.

To protect an MD against accidental erasure

To make it impossible to record on an MD, slide the tab in the direction of arrow, opening the slot. To allow recording, close the slot.



Playing an MD



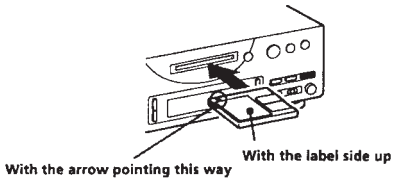
When "REMOTE" appears in the display

The deck is set to be operated from the connected personal computer. You cannot operate the deck from the buttons on the front panel or remote.
To use the buttons on the front panel or remote, quit the MD editor application, turn off the deck, then turn it back on.

1 Turn on the amplifier and set the source selector to the position for MD deck.

2 Press I/⏻.
The STANDBY indicator turns off.

3 Insert an MD.



4 Press ▷II (or ▷).
The deck starts playing. Adjust the volume on the amplifier.

You can locate and play back a track in Step 4

1 Turn AMS (or press I◀◀ or ▶▶I) until the number of the track you want to play appears.
2 Press AMS or ▷II (or ▷).

To	Do the following:
Stop playing	Press ■.
Pause playing	Press ▷II (or II). Press the button again to resume playing.
Go to the next track	Turn AMS clockwise (or press ▶▶I on the remote).
Go to the current track or the preceding track	Turn AMS counterclockwise (or press I◀◀ on the remote).
Take out the MD	Press ⏏ after stopping playing.

Notes on Recording

If "Protected" alternates with "C11" in the display

The MD is record-protected. Close the slot to record on the disc (see "To protect an MD against accidental erasure" on page 9).

If "CHECK OPT-IN" alternates with "C71" in the display

- The digital program source is not connected as you set with the INPUT switch in Step 4 on page 8.
  To continue, connect the program source properly.
- The program source is not on.
  Turn on the program source.

Depending on the menu settings and source being recorded, track numbers are marked in following ways:

- When recording from a CD or MD with INPUT at DIGITAL and the source connected through DIGITAL IN:
  The deck automatically marks track numbers in the same sequence as the original. If, however, a track is repeated two or more times (e.g. by single-track repeat play) or two or more tracks with the same track number (e.g. from different MDs or CDs) are played, the track or tracks are recorded as part of a single, continuous track with a single track number. If the source is an MD, track numbers may not be marked for tracks of less than 4 seconds.
- When recording with INPUT at DIGITAL, the deck may not automatically mark track numbers for some CD players and multi disc players. In these cases, mark the track numbers afterwards using the deck's Divide Function (see "Dividing Recorded Tracks" on page 30).
- When recording from source connected through LINE (ANALOG) IN with INPUT at ANALOG, and "LEVEL- SYNC" does not light up (see "Marking Track Numbers while Recording" on page 14) or when recording from DAT or satellite broadcasts connected through DIGITAL IN with INPUT at DIGITAL:
  The source will be recorded as a single track. You can divide the track afterwards using the Divide Function on page 30 or mark track numbers during recording by using the Track Marking Function on page 14.
  If "LEVEL-SYNC" appears in the display, the deck automatically marks track numbers when recording analog source or digital recording of DAT or satellite broadcasts (see "Marking track numbers automatically" on page 14).
- When recording from DAT or satellite broadcasts with INPUT at DIGITAL, the deck automatically marks a track number whenever the sampling frequency of the input signal changes.

When "TOC" flashes in the display

The deck is currently updating the Table Of Contents (TOC). Do not move the deck or pull out the AC power cord. Changes to an MD made through recording are saved only when you update the TOC by ejecting the MD or changing the deck to standby by pressing the I/⏻ switch.

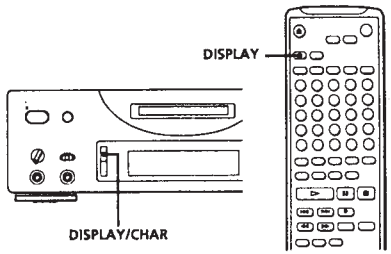
The MD deck uses the SCMS (Serial Copy Management System on page 40)

MDs recorded through digital input connector cannot be copied onto other MDs or DAT tapes through the digital output connector.

When the deck is recording or in recording pause, digital signals input through one of the digital input connectors are output to the DIGITAL OUT connector with the same sampling rate

To change the digital input signal to another sampling rate for output (without recording it to an MD), use Input Monitor Function (see page 12).

Useful Tips for Recording



Checking the remaining recordable time on the MD

Press DISPLAY/CHAR (or DISPLAY).

- When you press the DISPLAY/CHAR button repeatedly while the deck is stopped, the display changes as follows: total recording time → remaining recordable time on the MD → disc name (see page 19).
- When you press the DISPLAY/CHAR button repeatedly while recording, the display changes as follows: recording time of the current track → remaining recordable time on the MD → track name.

Monitoring the input signal (Input Monitor)

Before starting recording, you can monitor the selected input signal through the deck's output connectors.

1 Press ⏏ to remove the MD.

2 Set INPUT according to the input signal you want to monitor.

When the INPUT switch is set at ANALOG
The analog signal input through the LINE (ANALOG) IN jacks is output to the DIGITAL OUT connector after A/D conversion, and then to the LINE (ANALOG) OUT jacks and the PHONES jack after D/A conversion.

When the INPUT switch is set at DIGITAL
After passing through the sampling rate converter, the digital signal input through the respective digital input connector is output to the DIGITAL OUT connector, and after D/A conversion to the LINE (ANALOG) OUT jacks and PHONES jack.

Note
Even if you set REC MODE to MONO, the monitor signal does not become monaural.

3 Press ●.
If the INPUT switch is set at ANALOG, "AD-DA" appears in the display.
If the INPUT switch is set at DIGITAL, "-DA" appears in the display.

If "Auto Cut" appears in the display (Auto Cut)

There has been no sound input for about 30 seconds during recording. The 30 seconds of silence are replaced by a blank of about 3 seconds and the deck changes to recording pause.
Note that this function does not activate even if there has been no sound input for about 30 seconds when the deck started recording from the blank portion.

You can turn off the Auto Cut Function
For details, see "To turn off the Smart Space Function and Auto Cut Function" below. Note that when you turn off the Auto Cut Function, the Smart Space Function is turned off automatically.

If "Smart Space" appears in the display (Smart Space)

There has been an extended silence of 4 to 30 seconds in length during recording. The silence is replaced with a blank of about 3 seconds and the deck continues recording. Note that new track numbers may not be marked for portions recorded while this function is activated. Also, the Smart Space Function does not activate even if there has been an extended silence of 4 to 30 seconds in length when the deck started recording from the blank portion.

To turn off the Smart Space Function and Auto Cut Function

1 While the deck is stopped, press EDIT/NO twice to display "Setup Menu".
2 Turn AMS to select "S.Space", then press AMS.
3 Turn AMS to select "S.Space Off", then press AMS.
4 Press EDIT/NO.

To turn on the Smart Space Function and Auto Cut Function again

1 Do Steps 1 and 2 in "To turn off the Smart Space Function and Auto Cut Function" above.
2 Turn AMS to select "S.Space On", then press AMS.
3 Press EDIT/NO.

Notes

- When you turn off the Smart Space Function, the Auto Cut Function is also turned off automatically.
- The Smart Space Function and Auto Cut Function are factory set to on.
- If you turn off the deck or disconnect the AC power cord, the deck will recall the last setting (On or Off) of the Smart Space and Auto Cut Functions the next time you turn on the deck.

Playing back tracks just recorded

Do this procedure to immediately play back tracks that have just been recorded.

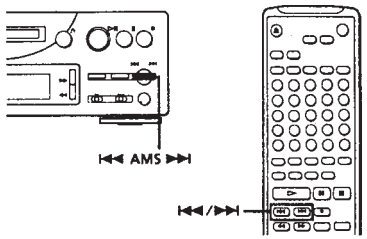
Press ▷II (or ▷) immediately after stopping recording.
Playback starts from the first track of the material just recorded.

To play from the first track of the MD after recording

1 Press ■ again after stopping recording.
2 Press ▷II (or ▷).
Playback starts from the first track of the MD.

Recording Over Existing Tracks

Follow the procedure below to record over existing material just as you would on an analog cassette tape.



1 Do Steps 1 to 5 in "Recording on an MD" on page 8.

2 Turn AMS (or press I◀◀ or ▶▶I) until the number of the track to be recorded over appears.

3 To record from the start of the track, continue from Step 6 in "Recording on an MD" on page 9.

While "TRACK" flashes in the display
The deck is recording over an existing track, and stops flashing when it reaches the end of the recorded portion.

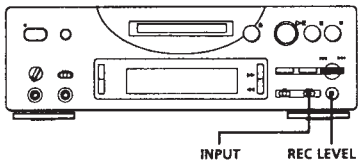
To record from the middle of the track

1 After Step 2 above, press ▷II (or ▷) to start playback.
2 Press ▷II (or II) where you want to start recording.
3 Continue from Step 6 in "Recording on an MD" on page 9.

Note
You cannot record from the middle of an existing track when the "PROGRAM" or "SHUFFLE" is on.

Adjusting the Recording Level

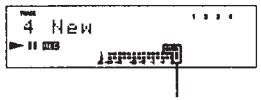
When recording with INPUT at ANALOG and the signal input through LINE (ANALOG) IN jacks, use REC LEVEL to adjust the recording level before starting recording.
You cannot adjust the recording level during digital recording.



1 Do Steps 1 to 6 in "Recording on an MD" on pages 8 and 9.

2 Play the portion of the program source with the strongest signal level.

3 While monitoring the sound, press REC LEVEL to bring out of knob, then turn it to adjust the recording level. The peak level meters should just reach the 0 dB mark (without lighting the red OVER indicator) when the source reaches its peak level.
Occasional lighting of the OVER indicator is acceptable.



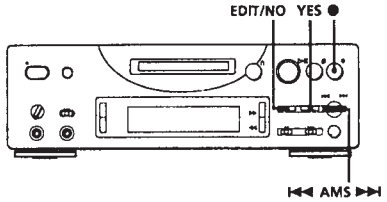
Without turning on the OVER indication

4 Stop playing the program source.

5 To start recording, do the procedure starting from Step 8 in "Recording on an MD" on page 9.

Marking Track Numbers While Recording (Track Marking)

You can mark track numbers either manually or automatically. By marking track numbers at specific points, you can quickly locate the points later using the AMS Function, or use various Editing Functions.



Marking track numbers manually (Manual Track Marking)

You can mark track numbers at any time while recording on an MD.

Press ● at the place you want to add a track mark while recording.

Marking track numbers automatically (Automatic Track Marking)

The deck adds track marks differently in the following cases:

- When recording from CDs or MDs with the INPUT switch set at DIGITAL:
  The deck marks track numbers automatically. However, the Automatic Track Marking Function does not activate when recording from some CD players and multi disc players.
- In all other cases:
  If "T.Mark LSync" is selected in T.Mark Menu, the deck marks a new track number whenever the signal drops and rises to a certain point.

To select "T.Mark Off" or "T.Mark LSync" in T.Mark Menu, do the procedure below:

1 While the deck is stopped, press EDIT/NO twice to display "Setup Menu".

2 Turn AMS to select "T.Mark LSync".
- **To set Automatic Track Marking on**
  Go to Step 3.
- **To set Automatic Track Marking off**
  Press AMS to flash the display and turn it to select "T.Mark Off", then press AMS.

3 Press EDIT/NO.

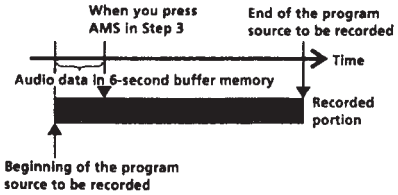
You can set the reference level that must pass before a rise marks a new track number
In Automatic Track Marking, the input signal must remain at or below a given reference level for 1.5 seconds or longer before a rise above the reference level will mark a new track number.
1 While the deck is stopped, press EDIT/NO twice to display "Setup Menu".
2 Turn AMS to select "LS (T)", then press AMS.
3 Turn AMS to set the reference level.
You can set the reference level at –72 dB to 0 dB in 2 dB steps.
4 After selecting the reference level, press AMS.
5 Press EDIT/NO.

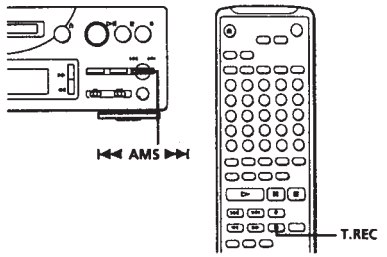
When you want to mark track numbers after you've finished recording
Use the Divide Function (see "Dividing Recorded Tracks" on page 30).

Note
If you turn off the deck or disconnect the AC power cord, the deck will recall the last settings of the Automatic Track Marking Function ("T.Mark LSync" or "T.Mark Off") the next time you turn on the deck.

Starting Recording With 6 Seconds of Prestored Audio Data (Time Machine Recording)

When recording from an FM or satellite broadcast, the first few seconds of material are often lost due to the time it takes you to ascertain the contents and press the record button. To prevent the loss of this material, the Time Machine Recording Function constantly stores 6 seconds of the most recent audio data in a buffer memory so that when you begin recording the program source using this function, the recording actually begins with the 6 seconds of audio data stored in the buffer memory in advance as shown in the illustration below.


When you press AMS in Step 3
End of the program source to be recorded
Time
Audio data in 6-second buffer memory
Recorded portion
Beginning of the program source to be recorded



1 Do Steps 1 to 6 in "Recording on an MD" on pages 8 and 9.
The deck changes to recording pause.

2 Start playing the program source you want to record.
The most recent 6 seconds of audio data is stored in the buffer memory.

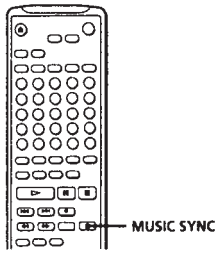
3 Press AMS (or T.REC) to start Time Machine Recording.
Recording of the program source starts with the 6 seconds of audio data stored in the buffer memory.

To stop Time Machine Recording
Press ■.

Note
The deck starts storing audio data when the deck is in recording pause and you start playing the program source. With less than 6 seconds of playing of the program source and audio data stored in the buffer memory, Time Machine Recording starts with less than 6 seconds of audio data.

Synchro-Recording With Audio Equipment of Your Choice (Music Synchro-Recording)

By using the MUSIC SYNC button on the remote, you can automatically start recording in sync with the signal input from the program source.
The method of marking track numbers differs, depending on the program source being recorded (see "Notes on Recording" on page 11).



1 Do Steps 1 to 5 in "Recording on an MD" on page 8.

2 Press MUSIC SYNC.
The deck changes to recording pause.

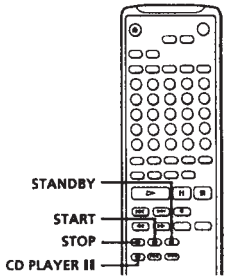
3 Start playing the program source you want to record.
The deck starts recording automatically.

To stop Music Synchro-Recording
Press ■.

Note
When Music Synchro-Recording, the Smart Space Function and the Auto Cut Function turn on automatically regardless of their setting (On or Off) and type of input (digital or analog).

Synchro-Recording With a Sony CD Player

By connecting your deck to a Sony CD player or Hi-Fi Component System, you can easily dub CDs onto MDs using the CD synchro buttons on the remote. If your deck is connected to a Sony CD player by a digital input cable, track numbers are automatically marked as appear on the original even when "T.Mark Off" is selected in T.Mark Menu. If your deck is connected to a Sony CD player by audio connecting cords through the LINE (ANALOG) IN jacks, track numbers are automatically marked when you set T.Mark Menu to "T.Mark LSync" (see page 14).
As the same remote controls both the CD player and the deck, you may have trouble operating both units if they are far from each other. If you do, place the CD player close to this deck.



1 Set the source selector on the amplifier to CD.

2 Do Steps 2 to 5 in "Recording on an MD" on page 8 to prepare the deck for recording.

3 Select the playback mode (Shuffle Play, Program Play, etc.) on the CD player.

4 Press STANDBY.
The CD player pauses for playing and the deck pauses for recording.

5 Press START.
The deck starts recording and the CD player starts playback.
The track number and elapsed recording time of the track appear in the display.

If the CD player does not start playing
Some CD player models may not respond when you press START on the remote of the deck. Press II on the remote of the CD player instead.

6 Press STOP to stop synchro-recording.

To pause recording
Press STANDBY or CD PLAYER II.
To restart recording, press START or CD PLAYER II.
A new track number is marked each time you pause recording.

Notes
- When the deck's remote controls the CD player with a mode selector, set the selector to CD1.
- The deck may not automatically mark track numbers when recording from some CD players and multi disc players.

You can use the remote of the CD player during synchro-recording
When you press ■, the CD player stops and the deck pauses for recording.
When you press II, the CD player pauses and the deck pauses for recording.
To restart synchro-recording, press ▷.

You can change CDs during synchro-recording
Do the following steps instead of Step 6 above.
1 Press ■ on the remote of the CD player.
The deck pauses for recording.
2 Change the CD.
3 Press ▷ on the remote of the CD player.
Synchro-recording restarts.

You can also do synchro-recording with a Sony video CD player
Using the procedure for synchro-recording with a Sony CD player, you can do synchro-recording with a Sony video CD player also.
To select the video CD player, press button number 2 while pressing down the I/⏻ button on the remote before starting the procedure.
To select the CD player again, press button number 1 while pressing down the I/⏻ button.
The deck is factory set to a CD player for synchro-recording.

You can check the remaining recordable time on the MD
Press DISPLAY/CHAR (see page 19).

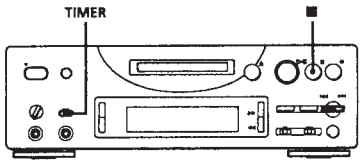
You can copy CD titles automatically during synchro-recording (Track Name Copy)
By connecting your deck to a Sony CD player with CONTROL A1 cable, you can copy the CD-TEXT information to the MD automatically during synchro-recording.
During the synchro-recording operation, the track names are stored on the MD along with the track numbers. The copied track name scrolls in the display. This function does not work in the following cases:

When	display
there are no track names on the CD	"NO NAME"
copy of TEXT information is prohibited	"TEXT PROTECT"
the maximum number of titles has been stored in the MD	"NAME FULL"

Note
You cannot use Track Name Copy function when recording over an existing track.

Recording on an MD Using a Timer

By connecting a timer (not supplied) to the deck, you can start and stop recording operations at specified times. For further information on connecting the timer and setting the starting and ending times, refer to the instructions that came with the timer.



1 Do Steps 1 to 7 in "Recording on an MD" on pages 8 and 9.

2
- If you want to specify the time for the start of recording, press ■.
- If you want to specify the time for the end of recording, do Steps 8 and 9 in "Recording on an MD" on page 9.
- If you want to specify the time for both start and end of recording, press ■.

3 Set TIMER on the deck to REC.

4 Set the timer as required.
- When you have set the time for the start of recording, the deck turns off. When the specified time arrives, the deck turns on and starts recording.
- When you have set the time for the end of recording, recording continues. When the specified time arrives, the deck stops recording and turns off.
- When you have set the time for both the start and end of recording, the deck turns off. When the starting time arrives, the deck turns on and starts recording. When the ending time arrives, the deck stops recording and turns off.

5 After you have finished using the timer, set TIMER on the deck to OFF. Then place the deck in standby status by plugging the AC power cord of the deck into a wall outlet or set the timer to continuous operation.
- If TIMER is left at REC, the deck will automatically start recording the next time you turn the deck on.
- If you do not change the deck to standby status for more than a week after timer recording has finished, the recorded contents may disappear.

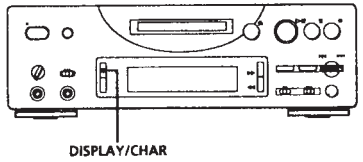
Make sure to change the deck to standby status within a week after timer recording is completed

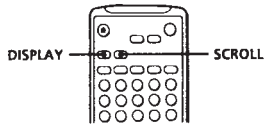
The TOC on the MD is updated and recorded contents are written to the MD when you turn the deck on. If the recorded contents have disappeared, "STANDBY" flashes when you turn the deck on.

Notes
- Be sure to quit the MD editor software before making a recording using the timer function.
- It may take about 30 seconds after the deck is turned on until recording starts. When recording at a specified time using the timer, be sure to take this time into account when setting the recording start time.
- During timer recording, new material is recorded from the end of the recorded portion on the MD.
- Material recorded during timer recording will be saved to the disc the next time you turn the deck on. "TOC Writing" will flash in the display at that time. Do not move the deck or pull out the AC power cord while "TOC Writing" is flashing.
- Timer recording will stop if the disc becomes full.

Using the Display

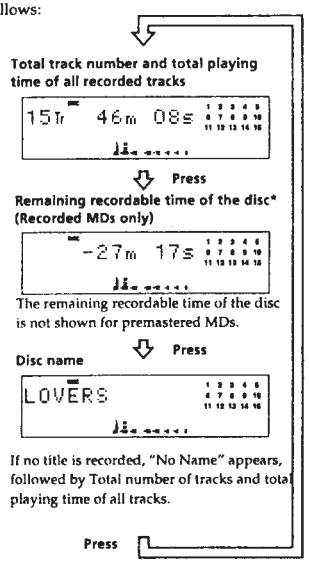
You can use the display to check disc and track information such as the total track number, total playing time of the tracks, remaining recordable time of the disc and disc name.





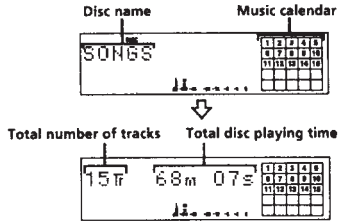
Checking the total track number, total disc playing time, remaining recordable time of the disc and the title of the disc

Each time you press DISPLAY/CHAR (or DISPLAY) while the deck is stopped, you can change the display as follows:


Total track number and total playing time of all recorded tracks
15Tr 46m 08s
Press
Remaining recordable time of the disc* (Recorded MDs only)
-27m 17s
The remaining recordable time of the disc is not shown for premastered MDs.
Press
Disc name
LOVERS
If no title is recorded, "No Name" appears, followed by Total number of tracks and total playing time of all tracks.
Press

- With monaural recording, you can record about two times longer than with stereo recording, so the remaining time is also about two times longer.

When you insert an MD, the disc name, total number of tracks, and total disc playing time appear in the display as follows:



The disc name appears, followed by the total number of tracks (Tr) and total disc playing time.
A music calendar showing all the track numbers appears within a grid if the MD is a premastered disc, or without a grid if the MD is a recordable disc.
If the total track number exceeds 25, ▶ appears to the right of number 25 in the music calendar.
To label a recordable disc and its tracks, see "Labeling Recordings" on page 32.

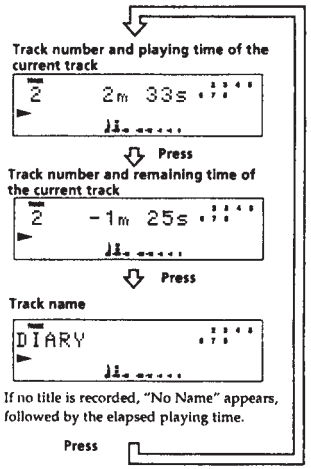
Note

When you insert a new MD or turn off the deck and turn it on again, the last item displayed will reappear.
If, however, you disconnect the AC power cord, the display will show the total track number and total playing time of all recorded tracks the next time you turn on the deck, no matter what the last display was.

(Continued)

Checking remaining time and the title of a track

Each time you press DISPLAY/CHAR (or DISPLAY) while playing an MD, you can change the display as shown below. The track numbers in the music calendar disappear after they are played.



If no title is recorded, "No Name" appears, followed by the elapsed playing time.

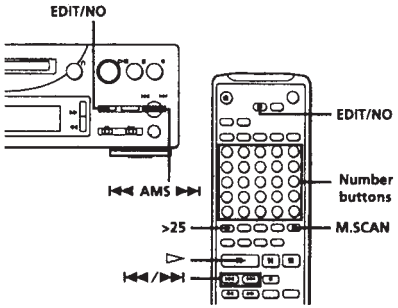
You can check the track name at any time while playing an MD

Press SCROLL.

Press SCROLL again to pause scrolling, and again to continue scrolling.

Locating a Specific Track

You can quickly locate any track while playing a disc by using AMS (Automatic Music Sensor), ⏮ and ⏭, number buttons or M.SCAN on the remote.



To locate	Do the following:
The next or succeeding tracks	During playback, turn AMS clockwise (or press ⏭ repeatedly) until you find the track.
The current or preceding tracks	During playback, turn AMS counterclockwise (or press ⏮ repeatedly) until you find the track.
A specific track directly [T]	Press number buttons to enter the track number.
A specific track by using AMS	1 Turn AMS until the track number you want to locate appears while the deck is stopped. (The track number is flashing.) 2 Press AMS or ▷II.
By scanning each track for 6 seconds (music scan) [T]	1 Press M.SCAN before you start playing. 2 When you find the track you want, press ▷ to start playing.

When you directly locate a track with a number over 25 [T]

You must press >25 first, before entering the corresponding digits.

Press >25 once if it is a 2-digit track number, and twice if it is a 3-digit track number.

To enter "0," press button 10.

Examples:
- To play track number 30
  Press >25 once, then 3 and 10.
- To play track number 100
  Press >25 twice, then 1, 10 and 10.

You can extend the playing time during music scan

1 While the deck is stopped, press EDIT/NO twice to display "Setup Menu".
2 Turn AMS to select "M.Scan Menu", then press AMS.
3 Turn AMS to select the playing time within a range of 6 to 20 seconds (in 1 second steps), then press AMS.
4 Press EDIT/NO.

To pause playing at the beginning of a track

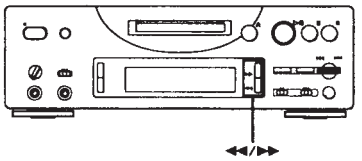
Turn AMS (or press ⏮ or ⏭) after pausing playback.

To go quickly to the beginning of the last track

Turn AMS counterclockwise (or press ⏮) while the display shows the total track number and total disc playing time, remaining recordable time of the disc, or disc name (see page 19).

Locating a Particular Point in a Track

You can also use ◀◀ and ▶▶ to locate a particular point in a track during playback or playback pause.



To locate a point	Press
While monitoring the sound	▶▶ (forward) or ◀◀ (backward) and keep pressing until you find the point.
Quickly by observing the display during playback pause	▶▶ or ◀◀ and keep pressing until you find the point. There is no sound output during this operation.

If "—Over—" appears while you are pressing ▶▶ during playback pause

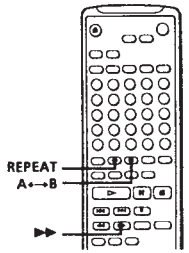
The disc has reached to its end. Press ◀◀ (or ⏮) or turn AMS counterclockwise to go back.

Notes

- If the disc reaches the end while you are pressing ▶▶ during sound monitoring, the deck stops.
- Tracks that are only a few seconds long may be too short to scan using the search function. For such tracks, it is better to play the MD at normal speed.

Playing Tracks Repeatedly

You can play tracks repeatedly in any play mode.



Press REPEAT.
"Repeat All" appears in the display.
The deck repeats the tracks as follows:

When the MD is played in	The deck repeats
Normal play (page 10)	All the tracks
Shuffle Play (page 23)	All the tracks in random order
Program Play (page 23)	The same program

To cancel repeat play
Press REPEAT several times until "Repeat off" appears.
The deck returns to the original playing mode.

Repeating the current track

While the track you want to repeat is playing in normal play, press REPEAT several times until "Repeat 1" appears in the display.

Repeating a specific portion (A-B Repeat)

You can play a specific portion of a track repeatedly. This might be useful when you want to memorize lyrics.
Note that you can only repeat a portion within the boundaries of a single track.

1 While playing a disc, press A↔B at the starting point (point A) of the portion to be played repeatedly.
"REPEAT" appears and "A-B" flashes in the display.

2 Continue playing the track or press ▶▶ until you reach the ending point (point B), then press A↔B again.
"REPEAT A-B" lights continuously. The deck starts to play the specified portion repeatedly.

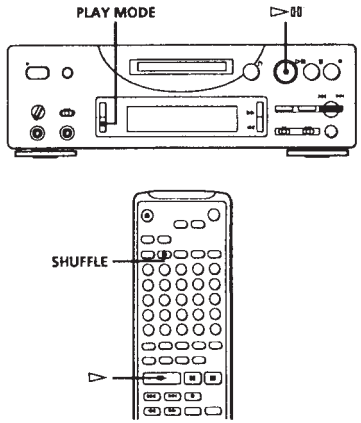
To cancel A-B Repeat
Press REPEAT or ■.

Setting new starting and ending points
You can repeat the portion immediately after the currently specified portion by changing the starting and ending points.
1 Press A↔B while "REPEAT A-B" appears.
The current ending point B becomes the new starting point A, "REPEAT" lights continuously, and "A-B" flashes in the display.
2 Continue playing the track or press ▶▶ until you reach the new ending point (point B), then press A↔B again.
"REPEAT A-B" lights continuously and the deck starts playing repeatedly the newly specified portion.

Note
If you turn off the deck or disconnect the AC power cord, the deck will recall the last setting of the Repeat Function the next time you turn on the deck.
The A-B Repeat settings, however, are lost.

Playing in Random Order (Shuffle Play)

You can have the deck "shuffle" tracks and play them in random order.



1 Press PLAY MODE repeatedly (or SHUFFLE once) until "SHUFFLE" appears in the display when the deck is stopped.

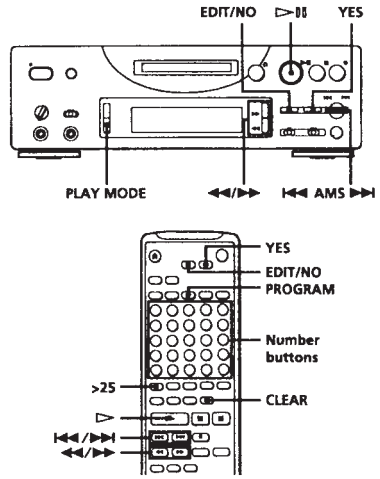
2 Press ⊳II (or ⊳) to start Shuffle Play.
"🔀" appears in the display while the deck is "shuffling" the tracks.

To cancel Shuffle Play
Press PLAY MODE repeatedly (or CONTINUE once) until "SHUFFLE" disappears when the deck is stopped.

You can specify tracks during Shuffle Play
Turn AMS (or press I◀◀ / ▶▶I).
- To play the next track, turn AMS clockwise (or press ▶▶I).
- To play from the beginning of the current track again, turn AMS counterclockwise (or press I◀◀). You cannot use AMS (or I◀◀) to go to tracks that have already been played.

Creating Your Own Program (Program Play)

You can specify the playback order of the tracks on an MD and create your own programs containing up to 25 tracks.



1 While the deck is stopped, press EDIT/NO twice to display "Setup Menu".

2 Turn AMS to display "Program ?", then press AMS.

3 Do either **a)** or **b)**:
a) When using the controls on the deck
1 Turn AMS until the track number you want appears in the display.
2 Press AMS.

If you enter the wrong track number
Press ◀◀ or ▶▶ until the wrong track number flashes, turn AMS to set the correct track number, then press AMS.
If "0" flashes, press ▶▶.

(Continued)

b) When using the remote

Press the number buttons to enter the tracks you want to program in the order you want. To program a track with a number over 25, use the >25 button (see page 21).

If you enter the wrong track number

Press ◀◀ or ▶▶ until the wrong track number flashes, then enter the correct track number with the number buttons.
If "0" flashes, press ▶▶.

To check the total time of the program

Press DISPLAY/CHAR (or DISPLAY).

4 Repeat Step 3 to enter other tracks.
The entered track is added to the location where the "0" flashes.
Each time you enter a track, the total program time is added up and appears in the display.

5 After finishing programming, press YES.
"Complete!!" appears and programming is completed.

6 Press PLAY MODE repeatedly (or PROGRAM once) until "PROGRAM" appears in the display.

7 Press ▷II (or ▷) to start Program Play.

To cancel Program Play

Press PLAY MODE repeatedly (or CONTINUE once) until "PROGRAM" disappears when the deck is stopped.

The program remains even after Program Play ends
When you press ▷II (or ▷), you can play the same program again.

Notes

- The display shows "- -m - -s" instead of the total playing time when the total playing time of the program exceeds 199 minutes.
- "ProgramFull!" appears when you program over 25 tracks. Erase the unnecessary tracks to enter other tracks.

Checking the track order

While the deck is stopped and "PROGRAM" is on, press DISPLAY/CHAR (or DISPLAY) several times. The track numbers appear in the order they were programmed as follow:
"/3 ➡ 5 ➡ 8 ➡ 1 ➡ 2/"

To check the rest of the track order

Turn AMS.
You can scroll the display to check all the track numbers you programmed.

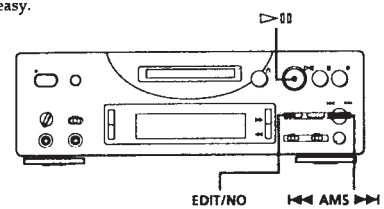
Changing the track order

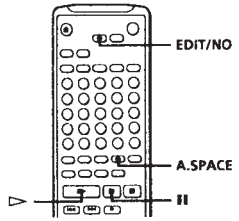
You can change the order of the tracks in your program before you start playing.

To		Do the following procedure after Steps 1 and 2 in "Creating Your Own Program":
Erase	a track	Press ◀◀ or ▶▶ until the track number you want to erase flashes, then press EDIT/NO or CLEAR.
	the whole program	Keep pressing EDIT/NO or CLEAR until all programmed track numbers disappear.
Add a track	to the beginning of the program	1 Press ◀◀ until "0" flashes at the left of the first track. 2 Do Steps 3 to 5 on pages 23 and 24.
	in the middle of the program	1 Press ◀◀ or ▶▶ until the track which precedes the track to be added flashes. 2 Press AMS so that "0" flashes, then do Steps 3 to 5 on pages 23 and 24.
	to the end of the program	1 Press ▶▶ until "0" flashes at the right of the last track. 2 Do Steps 3 to 5 on pages 23 and 24.
Change a track in the program		1 Press ◀◀ or ▶▶ until the track number you want to change flashes. 2 Do Steps 3 to 5 on pages 23 and 24.

Useful Tips when Recording from MDs to Tape

The Auto Space and Auto Pause Functions described in this section make recording from MDs to tape more easy.





Inserting blank spaces while recording to tape (Auto Space)

The Auto Space Function inserts a 3-second blank space between each track while recording from MDs to tapes, allowing you to use the AMS function during later playback.

1 While the deck is stopped, press EDIT/NO twice to display "Setup Menu".

2 Turn AMS to select "Auto" menu, then press AMS.

3 Turn AMS to select "Auto Space", then press AMS.

4 Press EDIT/NO.

You can turn on the Auto Space Function using the remote
While the deck is stopped, press A.SPACE repeatedly until "Auto Space" appears in the display.

To cancel Auto Space

Cancelling the function through menu operation on the deck

1 Do Steps 1 and 2 in "Inserting blank spaces while recording to tape" on this page.
2 Turn AMS to select "Auto Off", then press AMS.
3 Press EDIT/NO.

Cancelling the function using the remote
While the deck is stopped, press A.SPACE repeatedly until "Auto Off" appears.

Note

If the Auto Space Function is on while recording a selection containing multiple track numbers, (for example, a medley or symphony), blank spaces will be inserted within the selection whenever the track number changes.

Pausing after each track (Auto Pause)

When the Auto Pause Function is on, the deck pauses after playing each track. Auto Pause is convenient when recording single tracks or multiple, nonconsecutive tracks.

Select "Auto Pause" instead of "Auto Space" in Step 3 on "Inserting blank spaces while recording to tape" on this page.

You can turn on the Auto Pause Function using the remote
While the deck is stopped, press A.SPACE repeatedly until "Auto Pause" appears in the display.

To restart playback

Press ▷II (▷ or II).

To cancel Auto Pause

Cancelling the function through a menu operation on the deck

Do Steps 1 to 3 in "To cancel Auto Space" on this page.

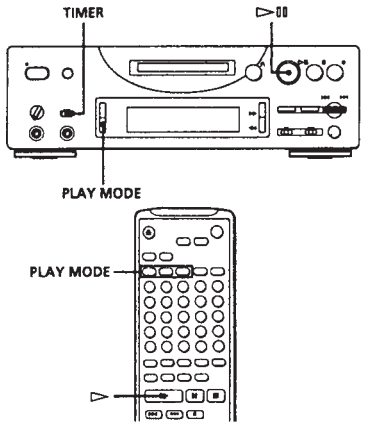
Cancelling the function using the remote
While the deck is stopped, press A.SPACE repeatedly until "Auto Off" appears.

Note

If you turn off the deck or disconnect the AC power cord, the deck will recall the last setting of the Auto Space and Auto Pause Functions the next time you turn on the deck.

Playing an MD Using a Timer

By connecting a timer (not supplied) to the deck, you can start and stop playback operations at specified times. For further information on connecting the timer or setting the starting and ending times, refer to the instructions that came with the timer.



1 Do Steps 1 to 3 in "Playing an MD" on page 10.

2 Press PLAY MODE repeatedly (or one of the PLAY MODE buttons once) to select the play mode you want.
To play only specific tracks, create a program (see page 23).

3 If you want to specify the time for the end of playback, press ⊳II (or ⊳) to start playback, then go to Step 4.

4 Set TIMER on the deck to PLAY.

5 Set the timer as required.
- When you have set the time for the start of playback, the deck turns off. When the specified time arrives, the deck turns on and starts playing.
- When you have set the time for the end of playback, playback continues. When the specified time arrives, the deck stops playing and turns off.
- When you have set the time for both the start and end of playback, the deck turns off. When the starting time arrives, the deck turns on and starts playing. When the ending time arrives, the deck stops playing and turns off.

6 After you have finished using the timer, set TIMER on the deck to OFF.

Notes
- Be sure to quit the MD editor software before playing by using the timer function.
- You can select Program Play in Step 2. Note, however, that programs eventually fade away when the standby status is off, and therefore if you set the time too far in the future, the program may be gone when the specified time arrives. If this has occurred, the deck enters normal play mode at the specified time and the tracks play in consecutive order.

Notes on Editing

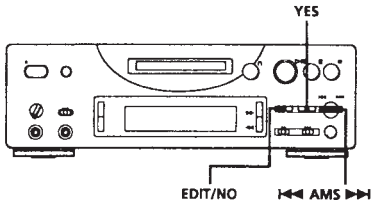
You can edit the recorded tracks after recording, using the following functions:
- Erase Function allows you to erase recorded tracks simply by specifying the corresponding track number.
- A-B Erase Function allows you to specify a portion within a track to erase it.
- Divide Function allows you to divide tracks at specified points so that you can quickly locate those points afterwards, using the AMS function.
- Combine Function allows you to combine two consecutive tracks into one.
- Move Function allows you to change the order of tracks by moving a specific track to a track position you want.
- Title Function allows you to create titles for your recorded MDs and tracks.

If "Protected" alternates with "C11" in the display
The deck could not edit because the record-protect slot on the MD is open. Edit after closing the slot.

When "TOC" and "TOC Writing" flash in the display
Do not move the deck or pull out the AC power cord. After editing, "TOC" lights continuously until you eject the MD or turn off the power. "TOC" and "TOC Writing" flash while the deck is updating the TOC. When the deck finishes updating the TOC, "TOC" goes off.

Erasing Recordings (ERASE Function)

Do the procedures below to erase following:
- A single track
- All tracks
- Portions of a Track (A–B Erase)

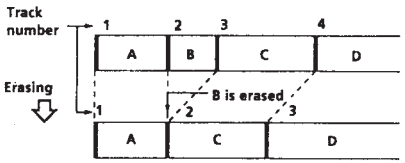


Erasing a single track

You can erase a track simply by specifying the respective track number. When you erase a track, the total number of tracks on the MD decreases by one and all tracks following the erased one are renumbered. Since erasing merely updates the TOC, there is no need to record over material.

To avoid confusion when erasing multiple tracks, you should proceed in order of high to low track number to prevent the renumbering of tracks that have not been erased yet.

Example: Erasing B



1 While the deck is stopped, playing, or pausing, press EDIT/NO to display "Edit Menu".

2 Turn AMS until "Erase ?" appears in the display.

3 Press AMS or YES.
The display for erasing tracks appears and playback of the displayed track starts.

(Continued)

4 Turn AMS to select the track to be erased.

5 Press AMS or YES.
When the track selected in Step 4 has been erased, "Complete!!" appears for a few seconds and the total number of tracks in the music calendar decreases by one.
The track following the erased track begins playing. (If you erase the last track, the track preceding the erased track starts playing.)

6 Repeat Steps 1 to 5 to erase more tracks.

To cancel the Erase Function

Press EDIT/NO or ■.

Note

If "Erase ???" appears in the display, the track was recorded or edited on another MD deck and is record-protected. If this indication appears, press AMS or YES to erase the track.

Erasing all tracks on an MD

Erasing a recordable MD deletes the disc name, all recorded tracks, and titles.

1 While the deck is stopped, playing, or pausing, press EDIT/NO to display "Edit Menu".

2 Turn AMS until "All Erase ?" appears in the display.

3 Press AMS or YES.
"All Erase??" appears in the display and all tracks in the music calendar start flashing.

4 Press AMS or YES.
When the disc name, all recorded tracks, and titles on the MD have been erased, "Complete!!" appears for a few seconds and the music calendar disappears.

To cancel the Erase Function

Press EDIT/NO or ■ to turn off the "All Erase ?" or "All Erase??" indication.

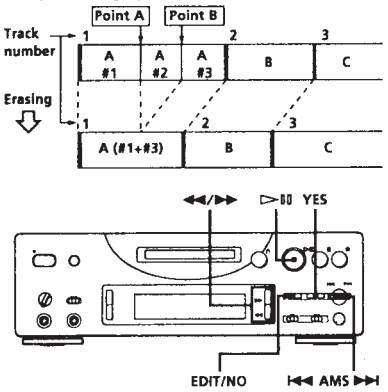
You can undo the Erase Function

Use the Undo Function immediately after you erased the track (see page 36).

Erasing a Part of a Track (A-B ERASE Function)

You can specify a portion within a track and erase the portion with ease. It is convenient when erasing unnecessary sections after recording satellite broadcast or FM broadcast.

Example: Erasing a part of track A



1 While the deck is stopped, playing, or pausing, press EDIT/NO to display "Edit Menu".

2 Turn AMS until "A-B Erase ?" appears in the display.

3 Press AMS or YES.

4 Turn AMS to select the number of the track, then press AMS or YES.
"-Rehearsal-" and "Point A ok?" alternates in the display while the deck plays back the selected track from the beginning.

5 While monitoring the sound, turn AMS to find the starting point of the portion to be erased (point A).
You can select the unit by which the starting point is shifted. Press the ◀◀ or ▶▶ button to select frame*, second, or minute.
For frame, the number of frames appears when you turn the AMS control; for second and minute, "s" or "m" flashes in the display.
* 1 frame is about 12 ms.

6 If the point A is still incorrect, repeat Step 5 until it is correct.

7 Press AMS or YES if the position is correct.
"Point B set" appears in the display and playback for setting the end point of the portion to be erased (point B) starts.

8 Continue playback (or press ◀◀ or ▶▶) until the deck reaches point B, then press AMS or YES.
"A-B Ers" and "Point B ok?" alternates in the display while the deck repeats a portion of a few seconds before point A and after point B successively.

9 Repeat Step 5 if point B is not correct.

10 Press AMS or YES when the position is correct.
"Complete!!" appears for a few seconds and the portion between point A and B is erased.

To cancel the A-B Erase Function

Press EDIT/NO or ■.

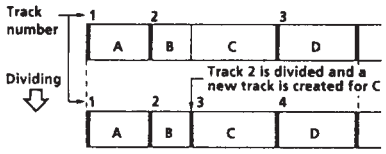
Note

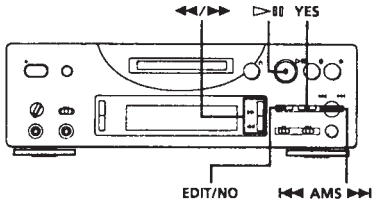
If "Impossible" appears in the display, this means:
- You specified point B comes before point A.
  Point B should be specified after point A.
- The specified portion cannot be erased.
  This sometimes happens when you've edited the same track many times, and is due to a technical limitation of the MD system, not a mechanical error.

Dividing Recorded Tracks (DIVIDE Function)

With the Divide Function you can mark a track number at places that you want to randomly access afterwards. Use this function to add tracks to MDs recorded from an analog source (and therefore contain no track numbers), or to divide an existing track into multiple portions for locating positions in the middle of a track. When you divide a track, the total number of tracks on the MD increases by one and all tracks following the divided track are renumbered.

Example: Dividing track 2 to create a new track for C





Dividing a track after selecting the track

1 While the deck is stopped, playing, or pausing, press EDIT/NO to display "Edit Menu".

2 Turn AMS until "Divide ?" appears in the display, then press AMS or YES.

3 Turn AMS to select the track to be divided and press AMS or YES.
"-Rehearsal-" appears in the display and the deck plays back the selected track from the beginning.

4 While monitoring the sound, turn AMS to find the point to divide the track.
You can select the unit by which the starting point is shifted. Press the ◀◀ or ▶▶ button to select frame, second, or minute.
For frame, the number of frames appears when you turn the AMS control; for second and minute, "s" or "m" flashes in the display.

5 Press AMS or YES when the position is correct.
"Complete!!" appears for a few seconds and the newly created track begins playing. The new track will have no track title even if the original track was labeled. The total number of tracks in the music calender increases by one.

To cancel the Divide Function
Press EDIT/NO or ■.

You can undo the Divide Function
Use the Undo Function immediately after you divided the track (see page 36).

You can divide a track while recording
Use the Track Marking Function (see page 14).

Dividing a track after selecting the dividing point

1 While playing the MD, press AMS at the point where you want to create a new track.
"-Rehearsal-" appears in the display and playback continues from the position you selected.

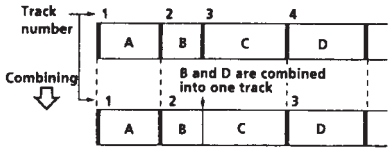
2 To make fine adjustment on the dividing position, do Step 4 in "Dividing a track after selecting the track" on this page.

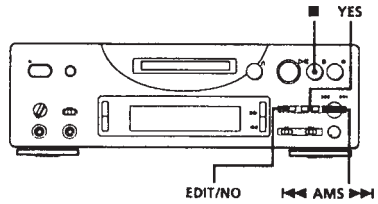
3 Press EDIT/NO to display "Divide ?", then press YES or AMS.

Combining Recorded Tracks (COMBINE Function)

Use the Combine Function to combine tracks on a recorded MD. The two tracks to be combined need not to be consecutive and the latter track to be combined can be the track which comes before the former one in the track number order. This function is useful for combining several songs into a single medley, or several independently recorded portions into a single track. When you combine two tracks, the total number of tracks decreases by one and all tracks following the combined tracks are renumbered.

Example: Combining B and D





1 While the deck is stopped, playing, or pausing, press EDIT/NO to display "Edit Menu".

2 Turn AMS until "Combine ?" appears in the display.

3 Press AMS or YES.

4 Turn AMS to select the first track of the two to be combined and press AMS or YES.
The display for selecting the second track appears and the deck repeats the portion where the two tracks will join (i.e., the end of the first track and the beginning of the succeeding track).

5 Turn AMS to select the second track of the two to be combined and press AMS or YES.
"Complete!!" appears for a few seconds and the total number of tracks in the music calendar decreases by one.
If both of the combined tracks have track titles, the title of the second track is erased.

To cancel the Combine Function
Press EDIT/NO or ■.

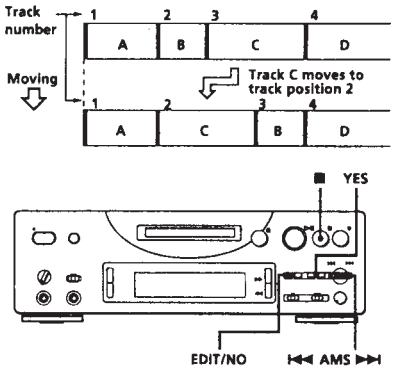
You can undo the Combine Function
Use the Undo Function immediately after you combined the tracks (see page 36).

Note
If "Impossible" appears in the display, the tracks cannot be combined. This sometimes happens when you've edited the same track many times, and is due to a technical limitation of the MD system, not a mechanical error.

Moving Recorded Tracks (MOVE Function)

Use the Move Function to change the order of any track. After you move a track, the track numbers between the new and old track positions are automatically renumbered.

Example: Moving track C to track position 2



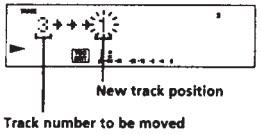
1 While the deck is stopped, playing, or pausing, press EDIT/NO to display "Edit Menu".

2 Turn AMS until "Move ?" appears in the display.

3 Press AMS or YES.

4 Turn AMS to select the track to be moved and press AMS or YES.

5 Turn AMS until the new track position appears.

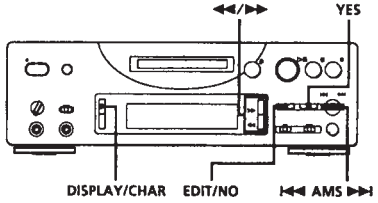


6 Press AMS or YES.
"Complete!!" appears for a few seconds and the moved track begins playing back.

To cancel the Move Function
Press EDIT/NO or ■.

Labeling Recordings (NAME Function)

You can create titles for your recorded MDs and tracks. Titles — which may consist of uppercase and lowercase letters, numbers and symbols for a maximum of about 1,700 characters per disc — appear in the display during MD operation. You can also use the remote to label a track or an MD (see "Labeling tracks and MDs with the remote" on page 34).



Use the following procedure to label a track or an MD. **You can label a track while it is playing, pausing or recording. If the track is recording, be sure to finish labeling before the track ends. If the track ends before you've completed the labeling procedure, the characters already entered are not recorded and the track will remain unlabeled.**

1 Press EDIT/NO to display "Edit Menu".

2 Turn AMS until "Name ?" appears in the display and press AMS or YES.
Skip this step while recording.

3 Turn AMS until "Nm In ?" appears in the display, then press AMS or YES.

4 Turn AMS to select "Disc" to label an MD, or to specify the track to label.
While recording, go to Step 6.

5 Press AMS or YES.
A flashing cursor appears in the display.

6 Press DISPLAY/CHAR to select the character type as follows:

To select	Press DISPLAY/CHAR repeatedly until
Uppercase letters	"A" appears in the display
Lowercase letters	"a" appears in the display
Numbers	"0" appears in the display

7 Turn AMS to select the character.
The selected character flashes.
Letters, numbers, and symbols appear in sequential order as you turn AMS.
You can use the following symbols in titles:

! " # $ % & ' ( ) * + , − . / : ; < = > ? @ _ `

You can press DISPLAY/CHAR to change the character type at any time during Step 7 (see Step 6).

8 Press AMS to enter the selected character.
The cursor shifts rightward and waits for the input of the next character.

9 Repeat Steps 6 to 8 until you have entered the entire title.

If you entered the wrong character
Press ◀◀ or ▶▶ until the character to be corrected starts flashing, and repeat Steps 7 and 8 to enter the correct character.

To erase a character
Press ◀◀ or ▶▶ until the character to be erased starts flashing, then press EDIT/NO.

To enter a space
Press ▶▶ while the cursor is flashing.

10 Press YES.
This completes the labeling procedure and the title appears in the display.

To cancel labeling
Press ■.

Note
You cannot label a track or an MD while you are recording over an existing track.

Copying a track or disc title

You can copy a track or disc title to use it as a title of another track or the disc title within a disc. Note that you can also do this operation by using the controls on the remote.

1 Press EDIT/NO to display "Edit Menu".

2 Turn AMS (or press ⏮ or ⏭) until "Name ?" appears in the display and press AMS or YES.

3 Turn AMS (or press ⏮ or ⏭) until "Nm Copy ?" appears in the display.

4 Press AMS or YES.

5 Turn AMS (or press ⏮ or ⏭) to select "Disc" to copy the disc title, or the track whose title you want to copy and press AMS or YES.

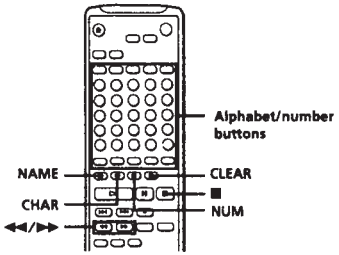
If "No Name" appears in the display
The disc or the track has no name.

6 Turn AMS to select "Disc" for disc title or to specify the track number to copy a title, and press AMS or YES.
"Complete!!" appears for a few seconds to indicate that the copying operation is completed.

If "Overwrite?" appears in the display
The disc or track you selected in Step 6 above has a title. If you continue the title copying, press AMS or YES.

To cancel title copying
Press EDIT/NO or ■.

Labeling tracks and MDs with the remote



1 Press NAME repeatedly until a flashing cursor appears in the display, then do the following:

To label	Make sure that the deck is
A track	Playing, pausing, recording the track to be labeled, or stopped after locating the track to be labeled
An MD	Stopped with no track number appearing in the display

2 Select the character type as follows:

To select	Press
Uppercase letters	CHAR repeatedly until "Selected ABC" appears in the display
Lowercase letters	CHAR repeatedly until "Selected abc" appears in the display
Numbers	NUM repeatedly until "Selected 123" appears in the display

3 Press an alphabet/number button to enter a character.
After you enter a character, the cursor shifts rightward and waits for the input of the next character.
You can change the character type at any time during Step 3 (see Step 2).

4 Repeat Step 2 and 3 until you have entered the entire title.

If you entered the wrong character
Press ◀◀ or ▶▶ until the character to be corrected starts flashing.
Press CLEAR or EDIT/NO to erase the incorrect character, then enter the correct one.

5 Press NAME again.
This completes the labeling procedure and the title appears in the display.

To cancel labeling
Press EDIT/NO or ■.

Changing an existing title

1 Press NAME, then do the following:

To change	Make sure that the deck is
A track title	Playing, pausing the track whose title is to be changed, or stopped after locating the track whose title is to be changed
A disc name	Stopped with no track number appearing in the display

2 Press CLEAR or EDIT/NO until the current title is erased.

3 Enter the new title.
Do Steps 6 to 9 of "Labeling Recordings" on page 32, or Steps 2 to 4 of "Labeling tracks and MDs with the remote" on page 34 and this page.

4 Press NAME.

Erasing a title on a disc (Name Erase)

Use this function to erase a title on a disc.

1 While the deck is stopped, playing, or pausing, press EDIT/NO to display "Edit Menu".

2 Turn AMS until "Name ?" appears in the display and press AMS or YES.
Skip this step while recording.

3 Turn AMS until "Nm Erase ?" appears in the display and press AMS or YES.

4 Turn AMS to select "Disc" to erase the disc title, or the track whose title you want to erase and press AMS or YES.
"Complete!!" appears for a few seconds and the title is erased.

To cancel Name Erase Function
Press EDIT/NO or ■.

Erasing all titles on a disc (Name All Erase)

Use this function to erase all titles on an MD simultaneously.

1 While the deck is stopped, playing, or pausing, press EDIT/NO to display "Edit Menu".

2 Turn AMS until "Name ?" appears in the display and press AMS or YES.

3 Turn AMS until "Nm All Ers?" appears in the display and press AMS or YES.
"Nm All Ers??" appears in the display.

4 Press AMS or YES.
"Complete!!" appears for a few seconds and all titles are erased.

To cancel the Name All Erase Function
Press EDIT/NO or ■.

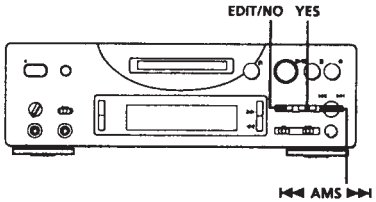
You can undo the Name All Erase Function
See "Undoing the Last Edit" on page 36.

You can erase all recorded tracks and titles
See "Erasing all tracks on an MD" on page 28.

Undoing the Last Edit (UNDO Function)

You can use the Undo Function to cancel the last edit and restore the contents of the MD to the condition that existed before editing was done. Note, however, that you cannot undo an edit if you do any of the following after the edit:

- Press the ● button on the deck.
- Press the ● button, the MUSIC SYNC button, or the CD SYNC STANDBY button on the remote.
- Update the TOC by turning off the power or ejecting the MD.
- Disconnect the AC power cord.



1 With the deck stopped and no track number appearing in the display, press EDIT/NO to display "Edit Menu".

2 Turn AMS until "Undo ?" appears in the display. "Undo ?" does not appear if no editing has been done.

3 Press AMS or YES.
One of the following messages appears in the display, depending on the type of editing to be undone:

Editing done:	Message:
Erasing a single track	"Erase Undo?"
Erasing all tracks on an MD	
Erasing a part of a track	
Dividing a track	"DivideUndo?"
Combining tracks	"CombinUndo?"
Moving a track	"Move Undo?"
Labeling a track or an MD	"Name Undo?"
Changing an existing title	
Erasing all titles on an MD	
Copying a title	

4 Press AMS or YES again.
"Complete!!" appears for a few seconds and the contents of the MD are restored to the condition that existed before the edit.

To cancel the Undo Function

Press EDIT/NO or ■.

Display Messages

The following table explains the various messages that appear in the display.
Also, the deck has a Self-Diagnosis Function (see page 44).

Message	Meaning
Blank Disc	A new (blank) or erased MD has been inserted.
Cannot Copy	An attempt was made to make a second copy from a digitally dubbed MD (see page 40).
Cannot Edit	An attempt was made to edit the MD during Program or Shuffle Play.
Disc Full	The MD is full (see "System Limitations" on this page).
Impossible	The deck cannot do the specified editing operation.
Name Full	The titling capacity of the MD has reached its limit (about 1,700 characters).
No Disc	There is no MD in the deck.
Premastered	An attempt was made to record on the premastered MD.
REMOTE	A personal computer is connected and the MD Editor software is starting up. If "REMOTE" appears in any other case, momentarily turn off the power.
Standby (flashing)	The contents recorded by timer have disappeared over time and are not be available for saving to disc, or Program Play could not be activated since the program has disappeared over time.

System Limitations

The recording system in your MiniDisc deck is radically different from those used in cassette and DAT decks and is characterized by the limitations described below. Note, however, that these limitations are due to the inherent nature of the MD recording system itself and not to mechanical causes.

"Disc Full" lights up even before the MD has reached the maximum recording time (60 or 74 minutes)
When 255 tracks have been recorded on the MD, "Disc Full" lights up regardless of the total recorded time. More than 255 tracks cannot be recorded on the MD. To continue recording, erase unnecessary tracks or use another recordable MD.

"Disc Full" lights up before the maximum number of tracks is reached
Fluctuations in emphasis within tracks are sometimes interpreted as track intervals, incrementing the track count and causing "Disc Full" to light up.

The remaining recording time does not increase even after erasing numerous short tracks
Tracks under 12 seconds in length are not counted and so erasing them may not lead to an increase in the recording time.

Some tracks cannot be combined with others
Track combination may become impossible when tracks are edited.

The total recorded time and the remaining time on the MD may not total the maximum recording time (60 or 74 minutes)
Recording is done in minimum units of 2 seconds each, no matter how short the material. The contents recorded may thus be shorter than the maximum recording capacity. Disc space may also be further reduced by scratches.

Tracks created through editing may exhibit sound dropout during search operations.

Track numbers are not recorded correctly
Incorrect assignment or recording of track numbers may result when CD tracks are divided into several smaller tracks during digital recording. Also, when the Automatic Track Marking Function is activated during recording, track numbers may not marked as in the original depending on the program source.

"TOC Reading" appears for a long time
If the inserted recordable MD is brand new, "TOC Reading" appears in the display longer than for MDs that have been used.

Tracks created through repeated editing, may exhibit sound dropout during playback.

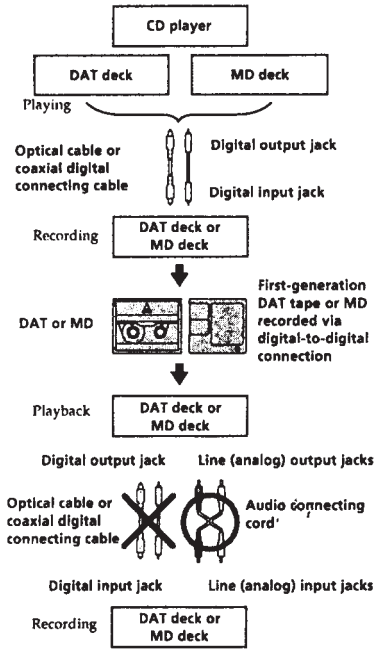
Limitations when recording over an existing track
- The correct remaining recording time may not be displayed.
- You may find it impossible to record over a track if that track has been recorded over several times already. If this happens, erase the track using the Erase Function (see page 27).
- The remaining recording time may be shortened out of proportion to the total recorded time.
- Recording over a track to eliminate noise is not recommended since this may shorten the duration of the track.
- You may find it impossible to label a track while recording over it.

The correct recorded/playing time may not be displayed during playback of monaural-format MDs.

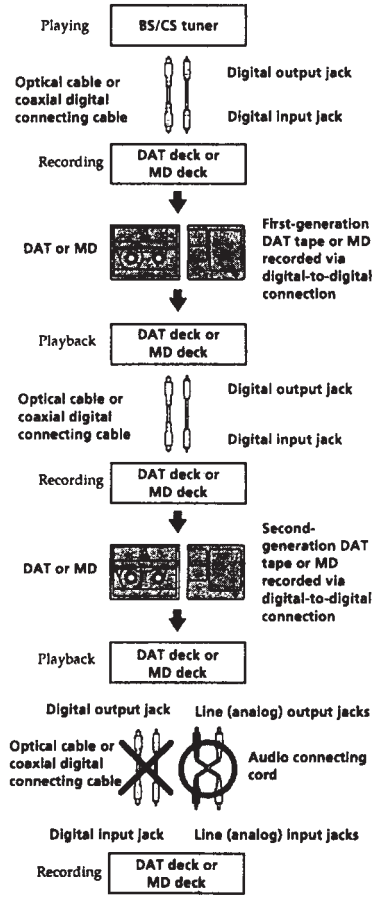
Guide to the Serial Copy Management System

This MD deck uses the Serial Copy Management System, which allows only first-generation digital copies to be made of premastered software via the deck's digital input jack. An outline of this system appears below:

1 You can record from digital program sources (CDs, DATs or premastered MDs) onto a DAT tape or recordable MD via digital input jack on the DAT or MD deck.
You cannot, however, record from this recorded DAT tape or MD onto another DAT tape or recordable MD via the digital input jack on the DAT or MD deck.



2 You can record the digital input signal of a digital satellite broadcast onto a DAT tape or recordable MD via the digital input jack on the DAT or MD deck which is capable of handling a sampling frequency of 32 kHz or 48 kHz.
You can then record the contents of this recorded DAT tape or MD (first-generation) onto another DAT tape or recordable MD via digital input jack on the DAT or MD deck to create a second-generation digital copy.
Subsequent recording from the second-generation copy onto another recordable DAT tape or MD is possible only through the analog input jack on the DAT or MD deck.
Note, however, that on some BS/CS tuners, second-generation digital copying may not be possible.



3 You can record a DAT tape or MD recorded via the DAT or MD deck's analog input jack onto another DAT tape or MD via the DAT or MD deck's digital output jack. You cannot, however, make a second-generation DAT tape or MD copy via the DAT or MD deck's digital output jack.

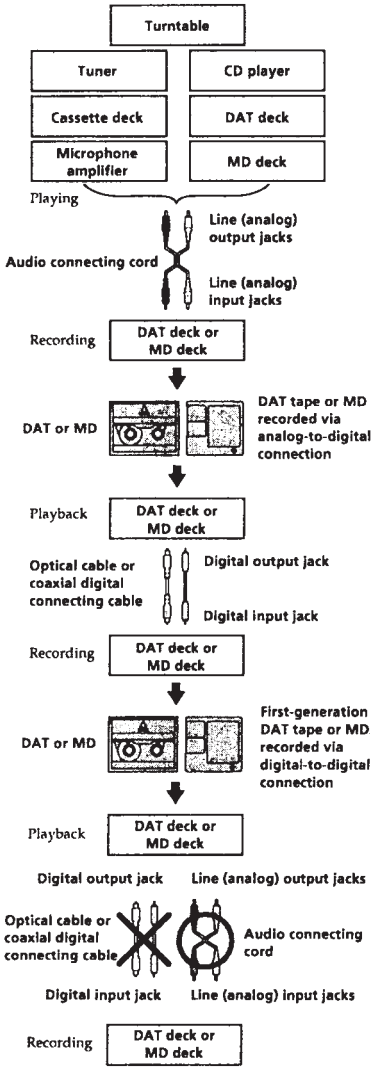


Table of Setup Menus

You can make various settings on this deck by using Setup Menus. Operation related to each menu were explained in the previous sections. The table below outlines each menu, including the various parameters and initial settings.

To enter the Setup Menu

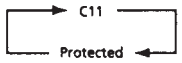
While the deck is stopped, press EDIT/NO twice to display "Setup Menu",
or
press EDIT/NO to display "Edit Menu" and turn AMS until "Setup ?" appears in the display, then press AMS.

Menu number	Function	Parameters	Initial setting	See
Program	Creates a program.	—	—	page 23
T. Mark	Sets the track marking function.	T.Mark Off, T.Mark LSync	T.Mark LSync	page 14
LS (T)	Sets the reference level of the input signal when "T.Mark LSync" is selected in T. Mark Menu.	LS(T) –72 to –0dB	LS(T) –50dB	page 15
Auto	Turns the Auto Space and Auto Pause Functions on and off.	Auto Off, Auto Space, Auto Pause	Auto Off	page 25
S. Space	Turns the Smart Space Function on and off.	S.Space Off, S.Space On	S.Space On	page 12
M. Scan	Sets the playing time during music scan.	M.Scan 6 to 20s	M.Scan 6s	page 20

Self-Diagnosis Function

The deck has a self-diagnosis display. This function shows a three-digit display (a combination of a letter and figures) and the corresponding message alternately, so you can check the deck's condition.
If such a display appears, check the following table in order to resolve the problem.
Should any problem persist, consult your nearest Sony dealer.

Self-diagnosis display

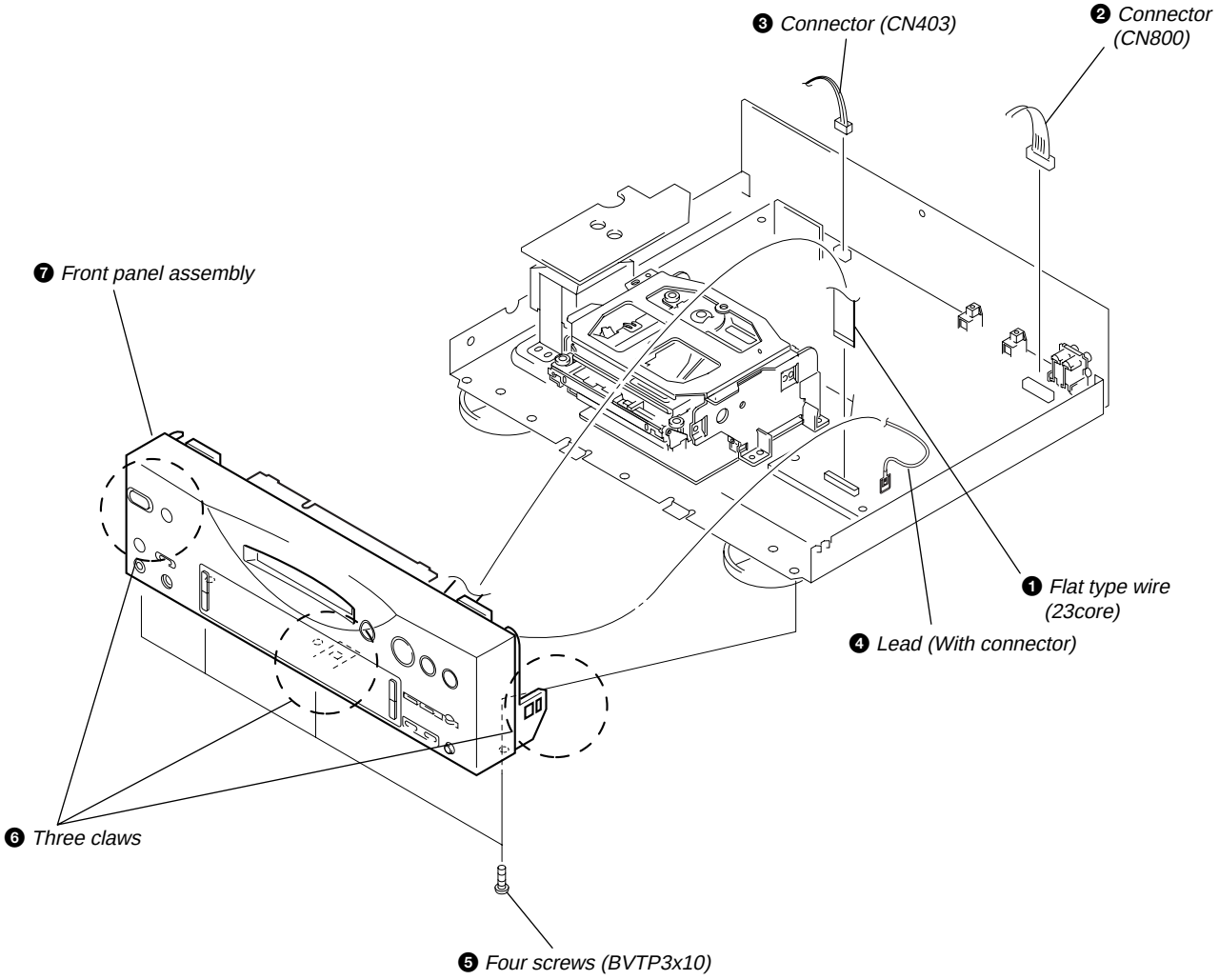


Three-digit display/Message	Cause/Remedy
C11/Protected	The inserted MD is record-protected. ➡ Take out the MD, and close the record-protect tab (page 9).
C13/REC Error	The recording was not made properly. ➡ Set the deck in a stable place, and repeat the recording procedure.
	The inserted MD is dirty (with smudges, fingerprints, etc.), scratched, or not up to standards. ➡ Replace the disc, and repeat the recording procedure.
C13/Disc Error	The deck could not read the TOC of the MD properly. ➡ Take out the MD, and insert it again.
C14/Disc Error	The deck could not read the TOC of the MD properly. ➡ Insert another disc. ➡ If possible, erase all tracks on the MD using the All Erase Function on page 28.
C71/Check OPT-IN	A moment's lighting is due to the signals of the digital program being recorded. This does not affect the recorded material.
	While recording from a digital component connected through the digital input connector, the digital connecting cable was unplugged or the digital component turned off. ➡ Connect the cable or turn the digital component back on.

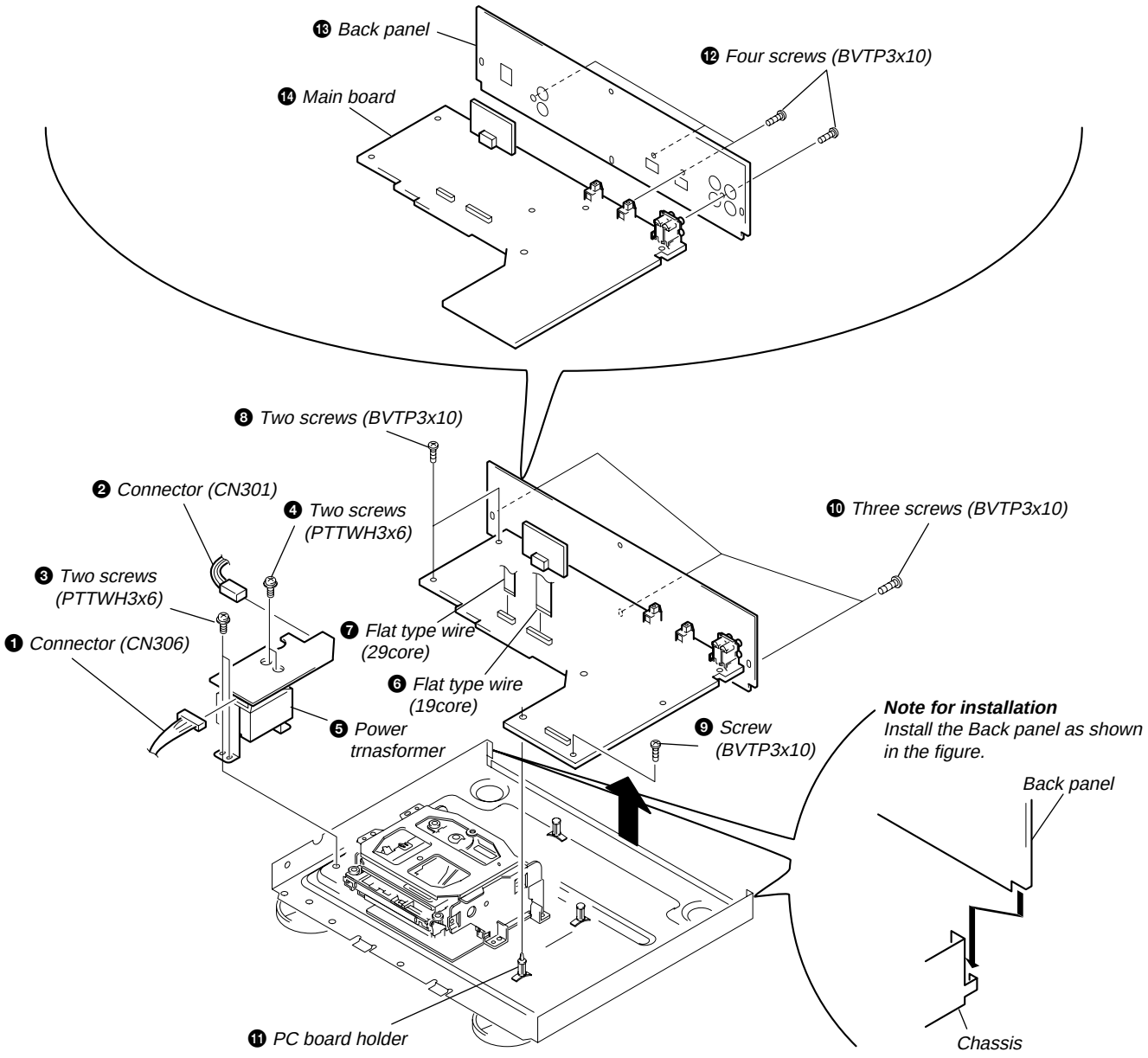
SECTION 3
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

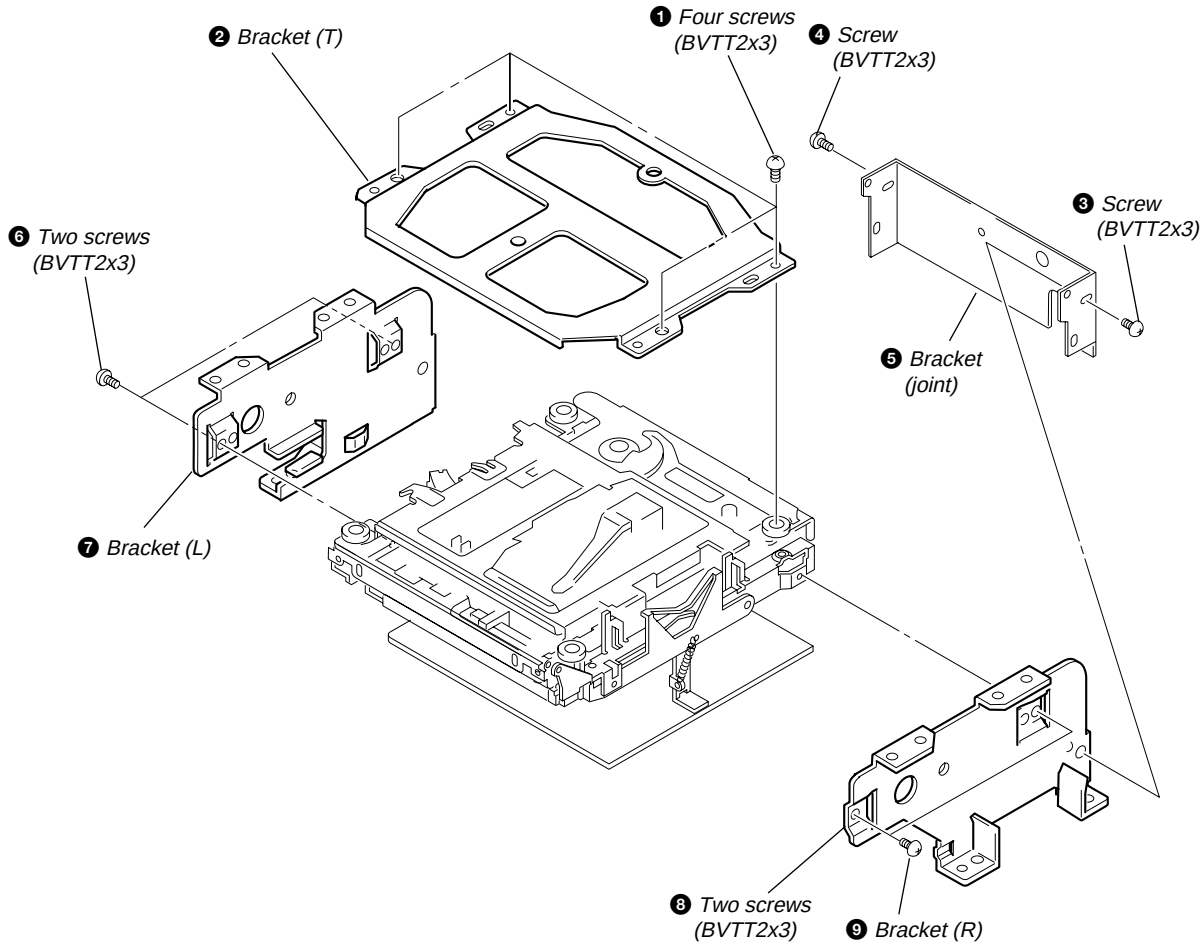
3-1. FRONT PANEL



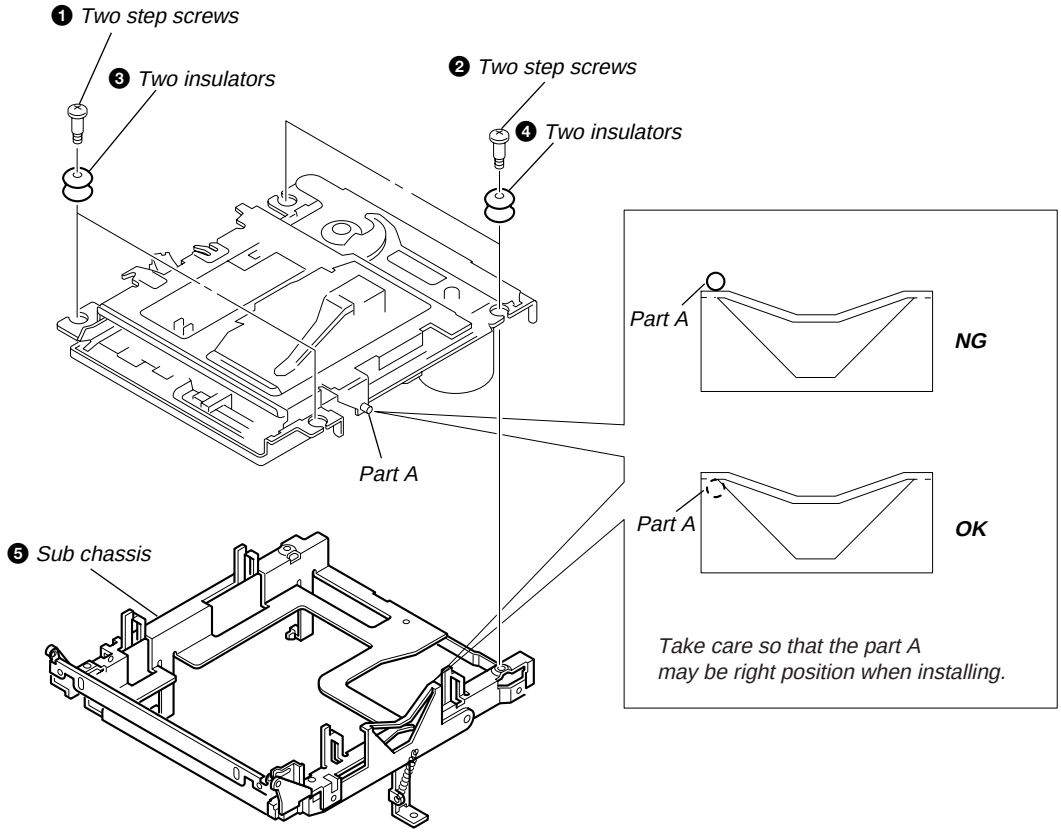
3-2. BACK PANEL AND MAIN BOARD



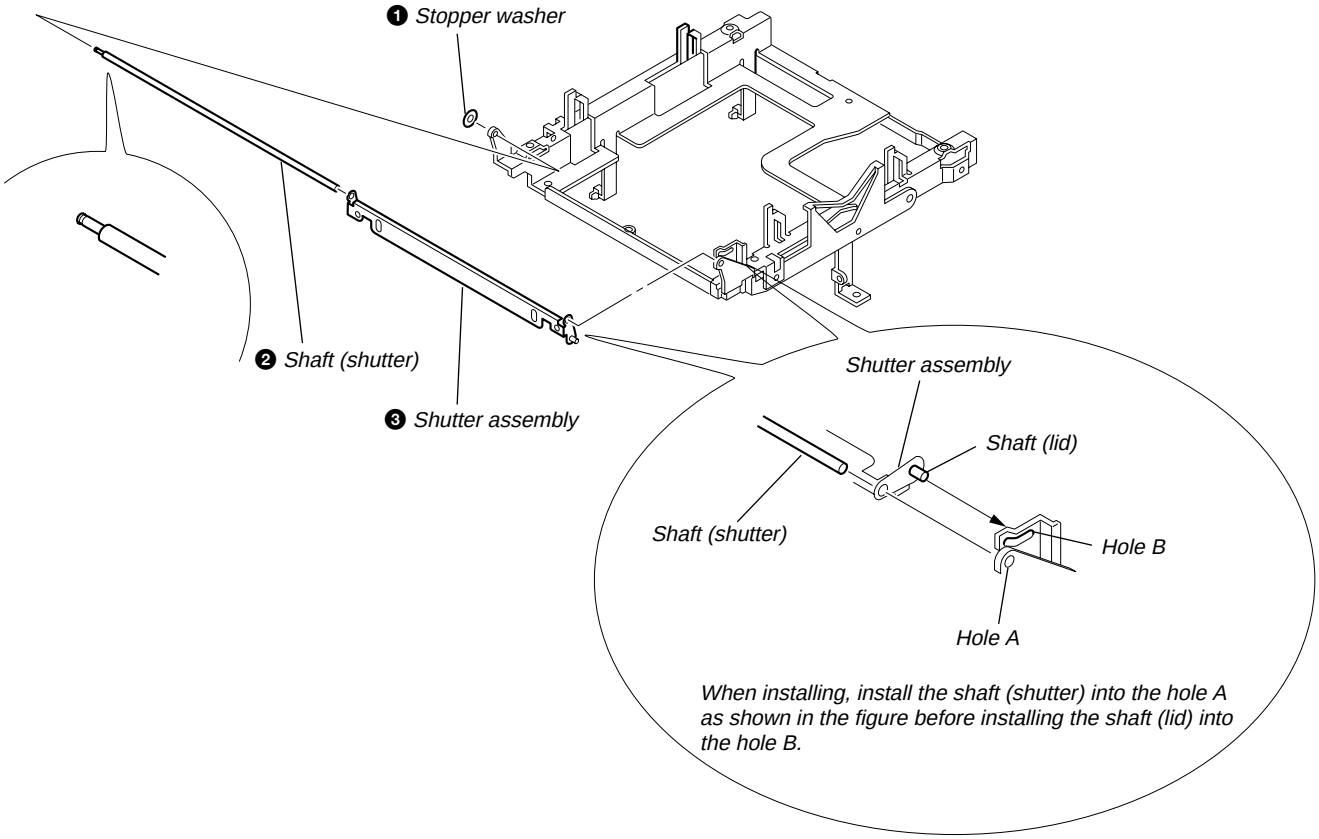
3-3. BRACKET (T)/(L)/(R)



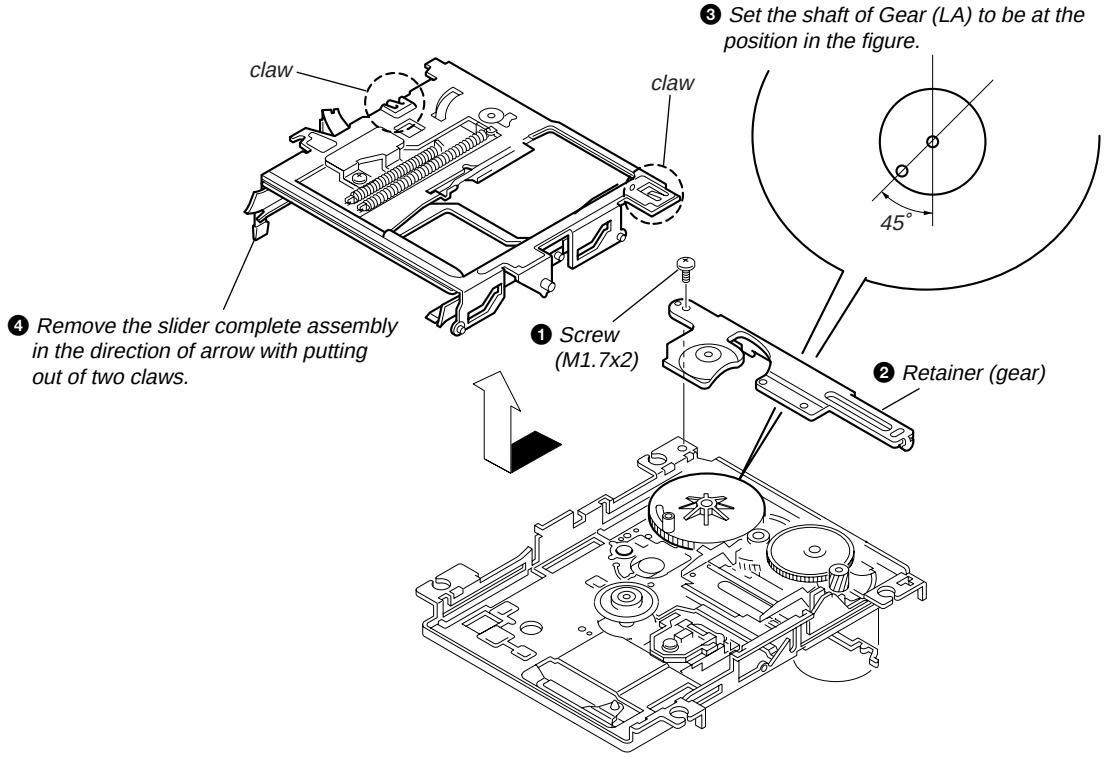
3-4. SUB CHASSIS



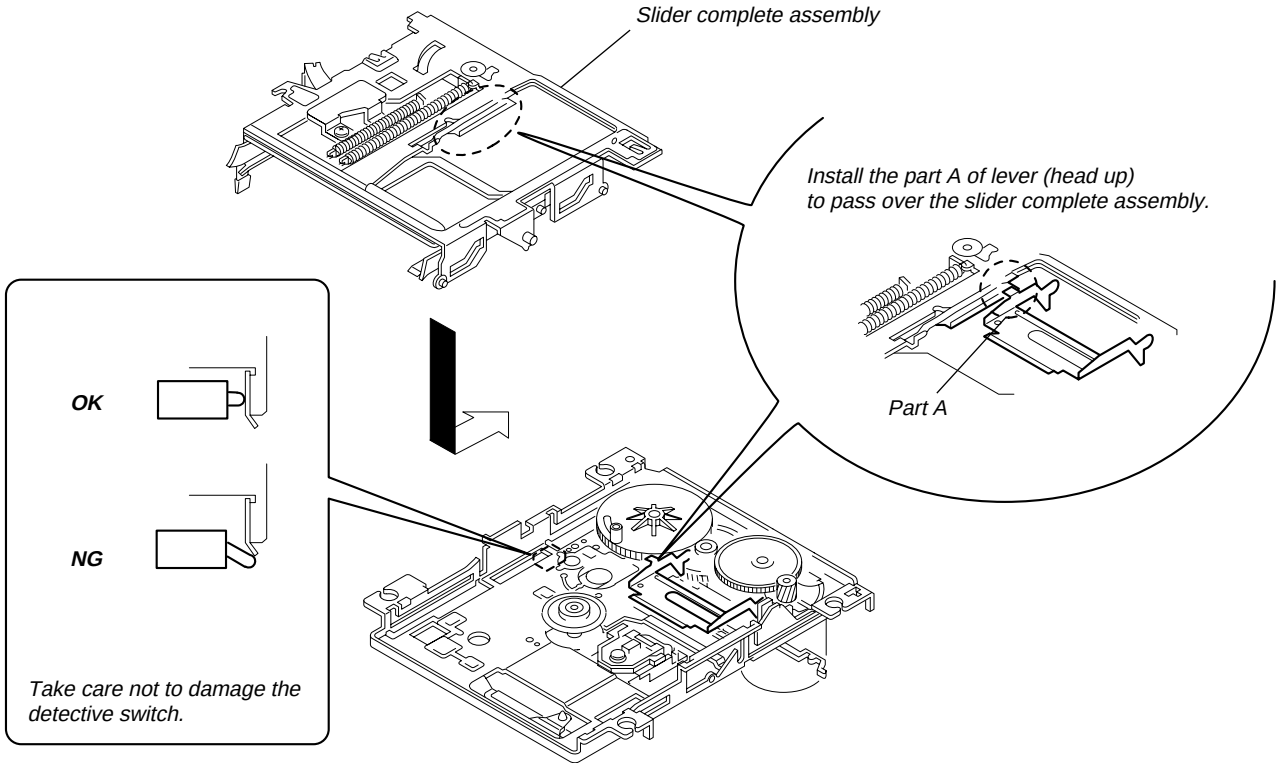
3-5. SHUTTER ASSEMBLY


❶ Stopper washer
❷ Shaft (shutter)
❸ Shutter assembly
Shutter assembly
Shaft (lid)
Shaft (shutter)
Hole B
Hole A
When installing, install the shaft (shutter) into the hole A as shown in the figure before installing the shaft (lid) into the hole B.

3-6. SLIDER COMPLETE ASSEMBLY


❸ Set the shaft of Gear (LA) to be at the position in the figure.
claw
claw
45°
❹ Remove the slider complete assembly in the direction of arrow with putting out of two claws.
❶ Screw (M1.7x2)
❷ Retainer (gear)

• Note for installation of Slider complete assembly


Slider complete assembly
Install the part A of lever (head up) to pass over the slider complete assembly.
Part A
OK
NG
Take care not to damage the detective switch.

SECTION 4
TEST MODE

4-1. PRECAUTIONS FOR USE OF TEST MODE

(1) As loading related operations will be performed regardless of the test mode operations being performed, be sure to check that the disc is stopped before setting and removing it.
Even if ⏏ button is pressed while the disc is rotating during continuous playback, continuous recording, etc., the disc will not stop rotating.
Therefore, it will be ejected while rotating.
Be sure to press the EDIT/NO button to stop the disc rotation before pressing the ⏏ button.

(2) Detection of the rec-proof tab is not performed in the test mode. Therefore, the contents of the recorded contents will be erased when operations in the mode for emitting the recording laser are performed (4-1-1) or when the ● button is pressed. Consequently, be careful not to set the continuous recording mode and traverse adjustment mode with a disc whose contents cannot be erased in the test mode.

4-1-1. Recording Laser Emission Mode and Operating Buttons

* Continuous recording mode (CREC MODE)
* Traverse adjustment mode (EFBAL ADJUST)
* Laser power adjustment mode (LDPWR ADJUST)
* Laser power check mode (LDPWR CHECK)
* Traverse (MO) check (EF MO CHECK)
* Traverse (MO) adjustment (EF MO ADJUST)
* When pressing the ● button.

4-2. SETTING THE TEST MODE

While pressing the AMS dial, connect the power plug to the outlet and release the AMS dial.

4-3. EXITING THE TEST MODE

With the TIMER knob set to “OFF”, press the POWER button. The STANDBY state will be set.

4-4. BASIC OPERATIONS OF THE TEST MODE

All operations are performed using the AMS dial, YES button, and EDIT/NO button.
The functions of these buttons are as follows.

Function name	Function
AMS knob	Changes parameters and modes
YES button	Proceeds onto the next step. Finalizes input.
EDIT/NO button	Returns to previous step. Stops operations.

4-5. SELECTING THE TEST MODE

There are altogether 23 test modes, shown in the following table. Rotating the AMS dial to the right switches to the mode below the current mode in the table while rotating to the left switches to the mode above. Each time the EDIT/NO button is pressed, the display changes in the following order;
"TEMP CHECK" → "TEMP ADJUST" → "SLED MOVE" → "TEMP CHECK"...

Display	Contents	Mark
TEMP CHECK	Temperature compensation offset check	
LDPWR CHECK	Laser power check	
EF MO CHECK	Traverse (MO) check	
EF CD CHECK	Traverse (CD) check	
FBIAS CHECK	Focus bias check	
CPLAY MODE	Continuous playback mode	
CREC MODE	Continuous recording mode	
Scurve CHECK	S curve check	(X)
DETRK CHECK	Detrack check	(X)
TEMP ADJUST	Temperature compensation offset adjustment	
LDPWR ADJUST	Laser power check	
EF MO ADJUST	Traverse (MO) check	
EF CD ADJUST	Traverse (CD) check	
FBIAS ADJUST	Focus bias check	
EEP MODE	Nonvolatile memory control	(X) (!)
MANUAL CMD	Command transfer	(X)
SVDATA READ	Status display	(X)
ERR DP MODE	Error history display, clear	
SLED MOVE	Sled check	(X)
ACCESS MODE	Access check	(X)
0920 CHECK	Outermost circumference check	(X)
HEAD ADJUST	Head position check	(X)
Ver@@@@@	Microprocessor version display	

- For details of each adjustment mode, refer to the items in "5. Electric Adjustments". For details of "ERR DP MODE", refer to the self-diagnosis function on page 2.
- If other modes are set accidentally, press the EDIT/NO button to exit that mode.
- As items marked (X) in the "Mark" column are not used during servicing, they are not described here. If these modes are set accidentally, press the EDIT/NO button to exit that mode. Be especially careful with items marked (!) as they will overwrite the non-volatile memory, and as a result, the unit will not operate normally.

4-5-1. Operating the Continuous Playback Mode

1. Entering the continuous playback mode
   (1) Set the disc in the unit. (Recordable discs or discs for playback only).
   (2) Rotate the AMS dial and display "CPLAY MODE".
   (3) Press the YES button to change the display to "CPLAY MID".
   (4) When access completes, the display changes to "C1= □□□□ AD= □□ ".
   Note: The numbers " □ " displayed indicate the error rate and "ADER".

2. Changing the part to be played back
   (1) When th YES button is pressed during continuous playback, the display changes as below, and the played back part can be changed.
   "CPLAY MID" → "CPLAY OUT" → "CPLAY IN" ↩
   (2) When access completes, the display changes to "C1= □□□□ AD= □□ ".
   Note: The numbers " □ " displayed indicate the error rate and "ADER".

3. Ending the continuous playback mode
   (1) Press the EDIT/NO button. The display changes to "CPLAY MODE".
   (2) Press the ⏏ button to remove the disc.
   Note: The playback start addresses for IN, MID, and OUT are as follows. To display the playback position address on the display, press the DISPLAY/CHAR button to display "CPLAY(□□□□)".
   IN: 40h cluster
   MID: 300h cluster
   OUT: 700h cluster

4-5-2. Operating the Continuous Recording Mode

1. Entering the continuous recording mode
   ① Set a recordable disc in the unit. (Refer to Note 3.)
   ② Rotate the [AMS] dial and display "CREC MODE".
   ③ Press the [YES] button to change the display to "CREC MID".
   ④ When access completes, the display changes to "CREC (□□□□)" and the **REC** display lights up.
   Note: The numbers " □ " displayed indicate the recording position address.

2. Changing the part to be recorded
   ① When th [YES] button is pressed during continuous recording, the display changes as below and the recorded part can be changed. The **REC** display is off while changing.
   "CPLAY MID" → "CPLAY OUT" → "CPLAY IN" ┐
   ↑ ┘
   ② When access completes, the display changes to "CREC MODE", and the **REC** display lights up.
   Note: The numbers " □ " displayed indicate the recording position address.

3. Ending the continuous recording mode
   ① Press the [EDIT/NO] button. The display changes to "CREC (□□□□)", and the **REC** display lights up.
   ② Press the [⏏] button to remove the disc.
   Note 1: The recording start addresses for IN, MID, and OUT are as follows.
   IN: 40h cluster
   MID: 300h cluster
   OUT: 700h cluster
   Note 2: The [EDIT/NO] button can be used to stop recording anytime.
   Note 3: The rec-proof tab will not be detected during the test mode. Be careful not to set the continuous recording mode with a disc whose contents cannot be erased.
   Note 4: Do not perform continuous recording for long periods of time above 5 minutes.
   Note 5: During continuous recording, be careful not to apply vibration.

4-5-3. Non-Volatile Memory Mode (EEP MODE)

This mode reads and writes the contents of the non-volatile memory.
It is not used in servicing. If set accidentally, press the [EDIT/NO] button immediately to exit it.

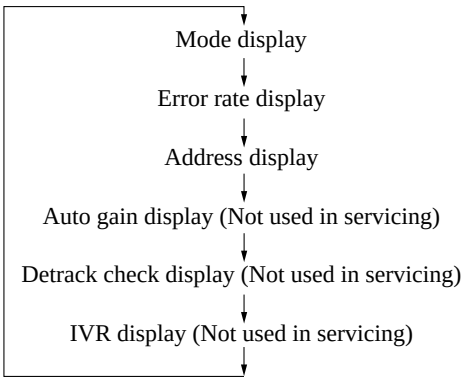
4-6. FUNCTIONS OF OTHER BUTTONS

Function	Contents
▷II	Sets continuous playback when pressed in the STOP state. Turns ON/OFF the tracking servo when pressed during continuous playback.
■	Stops the continuous playback and recording.
▶▶	Moves the sled to the external circumference only while the button is pressed.
◀◀	Moves the sled to the internal circumference only while the button is pressed.
● REC	Turns ON/OFF recording during continuous playback.
POWER (*NOTE) (TIMER : PLAY or REC)	Switches between bit and groove when pressed.
PLAY MODE	Switches the spindle servo mode (CLVS ⟷ CLV A).
DISPLAY/CHAR	Switches the displayed contents when pressed.
⏏	Ejects the disc.
POWER (*NOTE) (TIMER: OFF)	Exits the test mode.

***Note:** The function of the [POWER] button changes according to the position of the [TIMER] knob.

4-7. DISPLAYS DURING TEST MODE

The display changes according to the following sequence each time the DISPLAY/CHAR button is pressed.


Mode display
Error rate display
Address display
Auto gain display (Not used in servicing)
Detrack check display (Not used in servicing)
IVR display (Not used in servicing)

1. Mode display

"TEMP ADJUST" and "CPLAYMODE" are displayed.

2. Error rate display

The error rate is displayed as follows.
C1=□□□□ AD=□□
C1=:Indicates the C1 error.
AD=:Indicates ADER.

3. Address display

The address is displayed as follows.
(MO:Recordable discs, CD:Discs for playback only)
At this time, pressing the I/⏻ button with the TIMER knob set to PLAY switches the display between groove and bit.

h=□□□□s=□□□□(MO bit and CD)
h=□□□□a=□□□□ (MO groove)
h=Indicates the header address.
s=Indicates the SUBQ address.
a=Indicates the ADIP address.

Note: Displayed as "–" when servo is operated.

4. Auto gain display (Not used in servicing)

The auto gain is displayed as follows.
AG=□□/□□.□□

5. Detrack check display (Not used in servicing)

The detrack is displayed as follows.
ADR=□□□□□□□

6. IVR display (Not used in servicing)

IVR is displayed as follows.
[□□][□□][□□

Meanings of other displays

Display	Contents	
	When Lit	When Off
▷	Currently continuous playback (CLV:ON)	STOP (CLV:OFF)
▮▮	Tracking servo OFF	Tracking servo ON
REC	Recording mode ON	Recording mode OFF
–SYNC	CLV low speed mode	CLV normal mode
A.SPACE	ABCD adjustment completed	
OVER	Tracking offset cancel ON	Tracking offset cancel OFF
REPEAT	Tracking auto gain OK	
A-B	Focus auto gain OK	
TRACK	Bit	Groove
DISC	High reflection rate	Low reflection
DATE	CLV-S	CLV-A
CLOCK	CLV LOCK	CLV UNLOCK

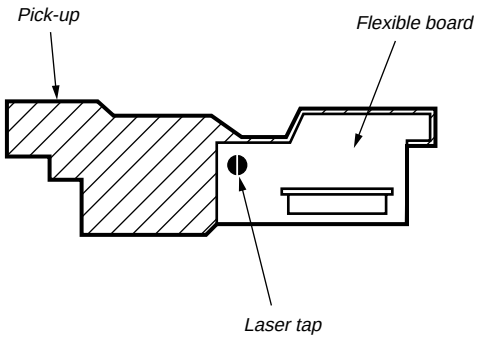
SECTION 5
ELECTRICAL ADJUSTMENTS

5-1. PRECAUTIONS FOR CHECKING LASER DIODE EMISSION

When checking the emission of the laser diode during adjustments, never view directly from the top as this may cause blindness.

5-2. PRECAUTIONS FOR USE OF OPTICAL PICK-UP (KMS-260A)

As the laser diode in the optical pick-up is easily damaged by static electricity, solder the laser tap of the flexible board when using it. Before disconnecting the connector, solder first. Before connecting the connector, be careful not to remove the solder. Also take adequate measures to prevent damage by static electricity. Handle the flexible board with care as it breaks easily.



5-3. PRECAUTIONS FOR ADJUSTMENTS

1) When replacing the following parts, perform adjustments and checks marked O in the order shown in the following table.

	Optical Pick-up	BD Board		
		IC171	D101	IC101, IC121, IC192
1. Temperature compensation offset adjustment	×	O	O	O
2. Laser power adjustment	O	O	×	O
3. Traverse adjustment	O	O	×	O
4. Focus bias adjustment	O	O	×	O
5. Error rate check	O	O	×	O

2) Perform the adjustment in the test mode.
   After completing the adjustments, exit the test mode.
3) Perform the adjustments in the order shown.
4) Use the following tools and measuring devices.
   - Check disc (MD) TDYS-1
     (Parts No.:4-963-646-01)
   - Laser power meter LPM-8001
     (Parts No.:J-2501-046-A)
   - Oscilloscope (Measure after calibration of the probe).
   - Digital voltmeter
   - Thermometer
   - Jig for checking the BD board waveform
     (Parts No.:J-2501-124-A)
5) When observing several signals on the oscilloscope, etc., make sure that the VC and ground do not connect inside the oscilloscope.
   (The VC and ground will short-circuit.)
6) Using the above jig enables the waveform to be checked without the need for soldering.
   (Refer to Servicing Note on page 5.)

5-4. CREATING THE CONTINUOUSLY RECORDED DISC

- The disc is used for the focus bias adjustment and error rate check. The following describes how to create a continuously recorded disc.

1. Insert a disc (blank disc) commercially available.
2. Rotate the AMS knob to display “CREC MODE”.
3. Press the YES button to display “CREC MID”.
   “CREC (0300)” will be momentarily displayed and recording started.
4. Complete recording within 5 minutes.
5. Press the NO button and stop recording.
6. Press the ⏏ button and remove the disc.

Create the continuous recorded disc for adjusting the focus bias and checking the error rate as described above.

Note:

- Be careful not to apply vibrations during continuous recording.

5-5. TEMPERATURE COMPENSATION OFFSET ADJUSTMENT

Save the current temperature data in the non-volatile memory as the 25 °C standard data.

Note:

1. Normally, this adjustment should not be performed.
2. Set the surrounding temperature to 22 to 28 °C when performing this adjustment.
   Also perform this adjustment immediately after the power is turned on when the internal temperature of the unit is the same as the surrounding temperature (22 to 28 °C).
3. After replacing D101, perform this adjustment after the temperature of parts reach the surrounding temperature.

Adjusting Procedure:

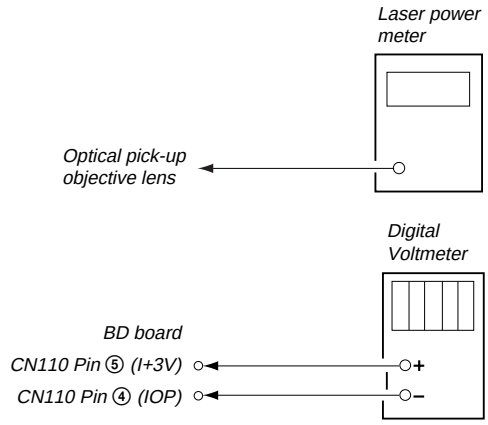
1. Rotate the AMS knob, to display "TEMP ADJUST".
2. Press the YES button and select the "TEMP ADJUST" mode.
3. "TEMP= ▯▯ " and the current temperature data are displayed.
4. To save the data:Press the YES button.
   If not saving the data:Press the NO button.
5. When the YES button is pressed, "TEMP= ▯▯ SAVE" is displayed, and then "TEMP ADJUST" is displayed again.
   "TEMP ADJUST" is displayed again immediately after the NO button is pressed.

Specification:

TEMP= ▯▯ should be E0 to EF. F0 to FF, 00 to 0F, 10 to 1F and 20 to 2F.

5-6. LASER POWER ADJUSTMENT

Connection:



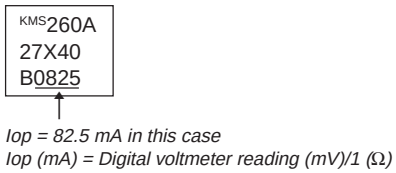
Adjusting Procedure:

1. Set the laser power meter on the objective lens of the optical pick-up from the disc slot. (If it cannot be set properly, press the ◀◀ or ▶▶ button to move the optical pick-up).
   Connect the digital voltmeter to Pin ⑤ (I+3V) and Pin ④ (IOP) of CN110.
2. Rotate the AMS knob to display "LDPWR ADJUST". (Laser power:For adjustment)
3. Press the YES button once to display "LD 0.9mW $@@".
4. Rotate the AMS knob so that the laser power meter reads 0.86 to 0.92 mW. Set the range knob of the laser power meter to 10 mW, press the YES button, and save the adjustment results in the non-volatile memory. ("LD SAVE $ ▯▯ " is displayed momentarily.)
5. "LD 7.0 mW $ ▯▯ " is next displayed.
6. Rotate the AMS knob so that the laser power meter reads 6.9 to 7.1 mW, press the YES button, and save the adjustment results in the non-volatile memory. ("LD SAVE $ ▯▯ " is displayed momentarily.)
   Note: Do not emit 7.0 mW continuously for more than 15 seconds.
7. Rotate the AMS knob to display "LDPWR CHECK".
8. Press the YES button once to display "LD 0.9mW $ ▯▯ ".
   Check that the laser power meter reading is 0.85 to 0.91 mW.
9. Press the YES button another time to display "LD 7.0mW $ ▯▯".
   Check that the readings of the laser power meter and digital voltmeter become the specified value.

Specified value

Laser power meter reading:7.0 ± 0.1 mW
Digital voltmeter reading:Value displayed on optical pick-up label ± 10%

(Optical pick-up label)



10. Press the NO button to display "LDPWR CHECK" and stop the laser emission.
    (The NO button is effective at all times to stop the laser emission.)

5-5. TEMPERATURE COMPENSATION OFFSET ADJUSTMENT

Save the current temperature data in the non-volatile memory as the 25 °C standard data.

Note:

1. Normally, this adjustment should not be performed.
2. Set the surrounding temperature to 22 to 28 °C when performing this adjustment.
   Also perform this adjustment immediately after the power is turned on when the internal temperature of the unit is the same as the surrounding temperature (22 to 28 °C).
3. After replacing D101, perform this adjustment after the temperature of parts reach the surrounding temperature.

Adjusting Procedure:

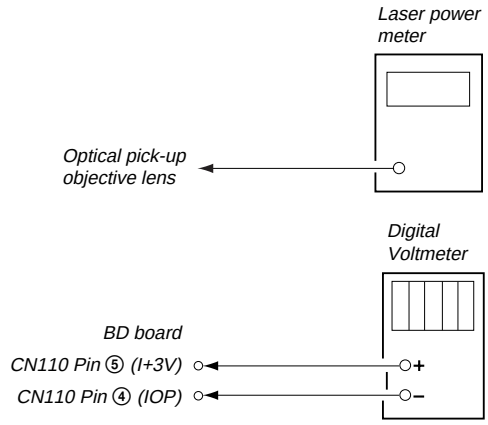
1. Rotate the AMS knob, to display "TEMP ADJUST".
2. Press the YES button and select the "TEMP ADJUST" mode.
3. "TEMP= ▯▯ " and the current temperature data are displayed.
4. To save the data:Press the YES button.
   If not saving the data:Press the NO button.
5. When the YES button is pressed, "TEMP= ▯▯ SAVE" is displayed, and then "TEMP ADJUST" is displayed again.
   "TEMP ADJUST" is displayed again immediately after the NO button is pressed.

Specification:

TEMP= ▯▯ should be E0 to EF. F0 to FF, 00 to 0F, 10 to 1F and 20 to 2F.

5-6. LASER POWER ADJUSTMENT

Connection:



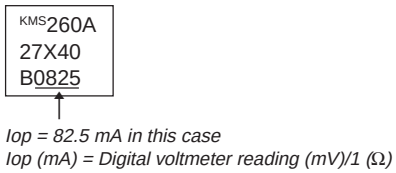
Adjusting Procedure:

1. Set the laser power meter on the objective lens of the optical pick-up from the disc slot. (If it cannot be set properly, press the ◀◀ or ▶▶ button to move the optical pick-up).
   Connect the digital voltmeter to Pin ⑤ (I+3V) and Pin ④ (IOP) of CN110.
2. Rotate the AMS knob to display "LDPWR ADJUST". (Laser power:For adjustment)
3. Press the YES button once to display "LD 0.9mW $@@".
4. Rotate the AMS knob so that the laser power meter reads 0.86 to 0.92 mW. Set the range knob of the laser power meter to 10 mW, press the YES button, and save the adjustment results in the non-volatile memory. ("LD SAVE $ ▯▯ " is displayed momentarily.)
5. "LD 7.0 mW $ ▯▯ " is next displayed.
6. Rotate the AMS knob so that the laser power meter reads 6.9 to 7.1 mW, press the YES button, and save the adjustment results in the non-volatile memory. ("LD SAVE $ ▯▯ " is displayed momentarily.)
   Note: Do not emit 7.0 mW continuously for more than 15 seconds.
7. Rotate the AMS knob to display "LDPWR CHECK".
8. Press the YES button once to display "LD 0.9mW $ ▯▯ ".
   Check that the laser power meter reading is 0.85 to 0.91 mW.
9. Press the YES button another time to display "LD 7.0mW $ ▯▯".
   Check that the readings of the laser power meter and digital voltmeter become the specified value.

Specified value

Laser power meter reading:7.0 ± 0.1 mW
Digital voltmeter reading:Value displayed on optical pick-up label ± 10%

(Optical pick-up label)



10. Press the NO button to display "LDPWR CHECK" and stop the laser emission.
    (The NO button is effective at all times to stop the laser emission.)

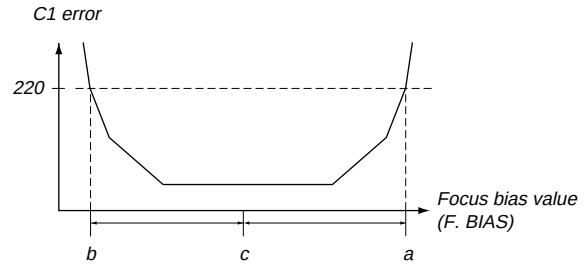
5-8. FOCUS BIAS ADJUSTMENT

Adjusting method:

1. Load a continuously recorded disc (Refer to "5-4. Creating the Continuously Recorded Disc".)
2. Rotate the AMS knob to display "CPLAY MODE".
3. Press the YES button to display "CPLAY MID".
4. When "C1= □□□□ AD= □□ " is displayed, press the NO button.
5. Rotate the AMS knob to display "FBIAS ADJUST".
6. Press the YES button to display " □□□□ / □□ a= □□ ".
   The first four digits indicate the C1 error rate, the two digits after the "/" indicate ADER and the two digits after "a=" indicate the focus bias value.
7. Rotate the AMS knob in the clockwise direction, and look for the focus bias value at which the C1 error rate becomes approximately 220 (Refer to Note 2).
8. Press the YES button to display " □□□□ / □□ b= □□ ".
9. Rotate the AMS knob in the counterclockwise direction, and look for the focus bias value at which the C1 error rate becomes 220.
10. Press the YES button to display " □□□□ / □□ b= □□ ".
11. Check that the C1 error rate is below 50 and that ADER is 00, and press the YES button.
12. If the value of "(□□)" in the " □□ - □□ - □□ (□□)" displayed is above 20, press the YES button.
    If below, press the NO button and start from step 2 again.
13. Press the ⏏ button and remove the continuously recorded disc.

Note 1: The following figure shows the relation between the C1 error and focus bias value. Look for points a and b in the following figure by the adjustment above. The focus position (point c) is automatically calculated from points a and b.

Note 2: As the C1 error rate changes, use the average value in the adjustment.



5-9. ERROR RATE CHECK

5-9-1. CD ERROR RATE CHECK

Checking Procedure:

1. Load a check disc (MD) TDYS-1.
2. Rotate the AMS knob to display "CPLAY MODE".
3. Press the YES button to display "CPLAY MID".
4. "C1= □□□□ AD= □□ " is displayed.
5. Check that the C1 error rate is below 20.
6. Press the NO button to stop playback. Then press the ⏏ button and remove the check disc (MD).

5-9-2. MO Error Rate Checking

Checking Procedure:

1. Load a continuously recorded disc (Refer to "5-4. Creating the Continuously Recorded Disc".)
2. Rotate the AMS knob to display "CPLAY MODE".
3. Press the YES button to display "CPLAY MID".
4. "C1= □□□□ AD= □□ " is displayed.
5. Check that the C1 error rate is below 50 and ADER is 00.
6. Press the NO button to stop playback. Then press the ⏏ button and remove the disc.

5-10. FOCUS BIAS CHECK

Change the focus bias value and check the focus tolerance amount.

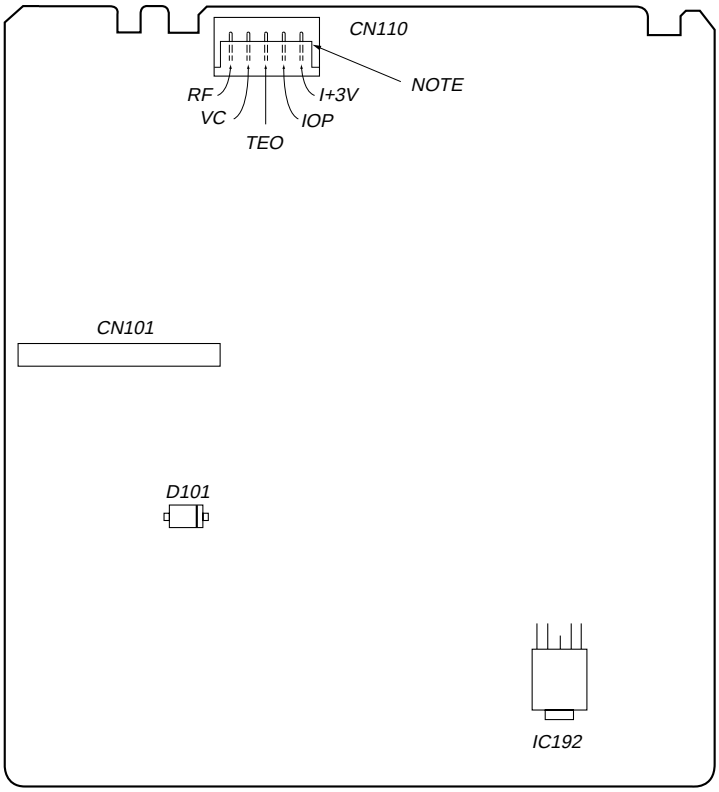
Checking Procedure:

1. Load a continuously recorded disc (Refer to "5-4. Creating the Continuously Recorded Disc".)
2. Rotate the AMS knob to display "CPLAY MODE".
3. Press the YES button to display "CPLAY MID".
4. When "C1= □□□□ AD= □□ " is displayed, press the NO button.
5. Rotate the AMS knob to display "FBIAS CHECK",
6. Press the YES button to display " □□□□ / □□ c= □□ ".
   The first four digits indicate the C1 error, the two digits after the "/" indicate ADER and the two digits after "c=" indicate the focus bias value.
   Check that the C1 error is below 50 and ADER is 00.
7. Press the YES button to change the display to " □□□□ / □□ b= □□ ".
   Check that the C1 error does not drop below 220 and ADER does not remain above 00.
8. Press the YES button to change the display to " □□□□ / □□ a= □□ ".
   Check that the C1 error does not drop below 220 and ADER does not remain above 00.
9. Press the NO button, press the ⏏ button next, and remove the continuously recorded disc.

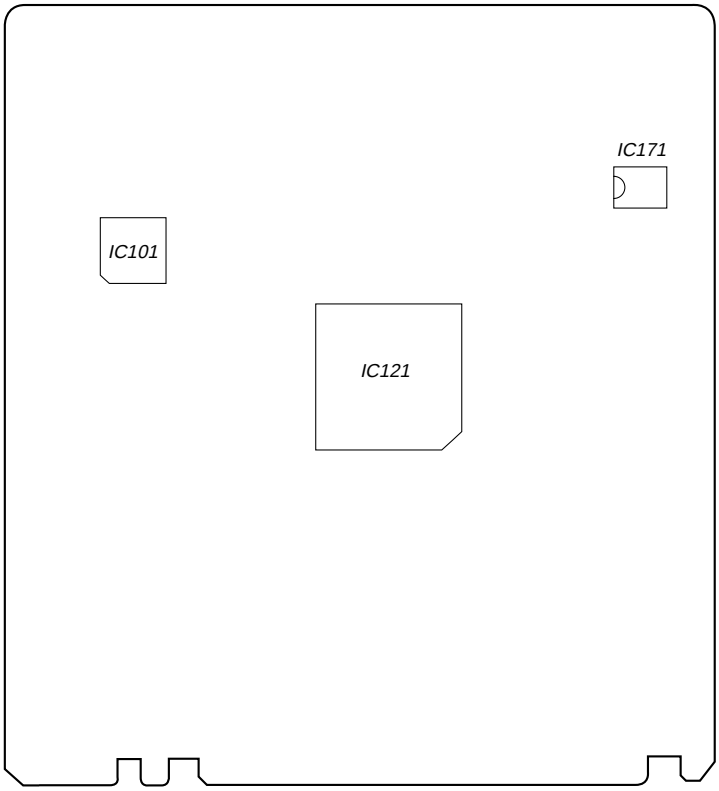
Note 1: If the C1 error is above 220 or ADER is above 00 only for point a (step 8 above) and point b (step 7 above), the focus bias may not be adjusted properly. In this case, adjust again.

5-11. ADJUSTING POINTS AND CONNECTING POINTS

[BD BOARD] (SIDE A)



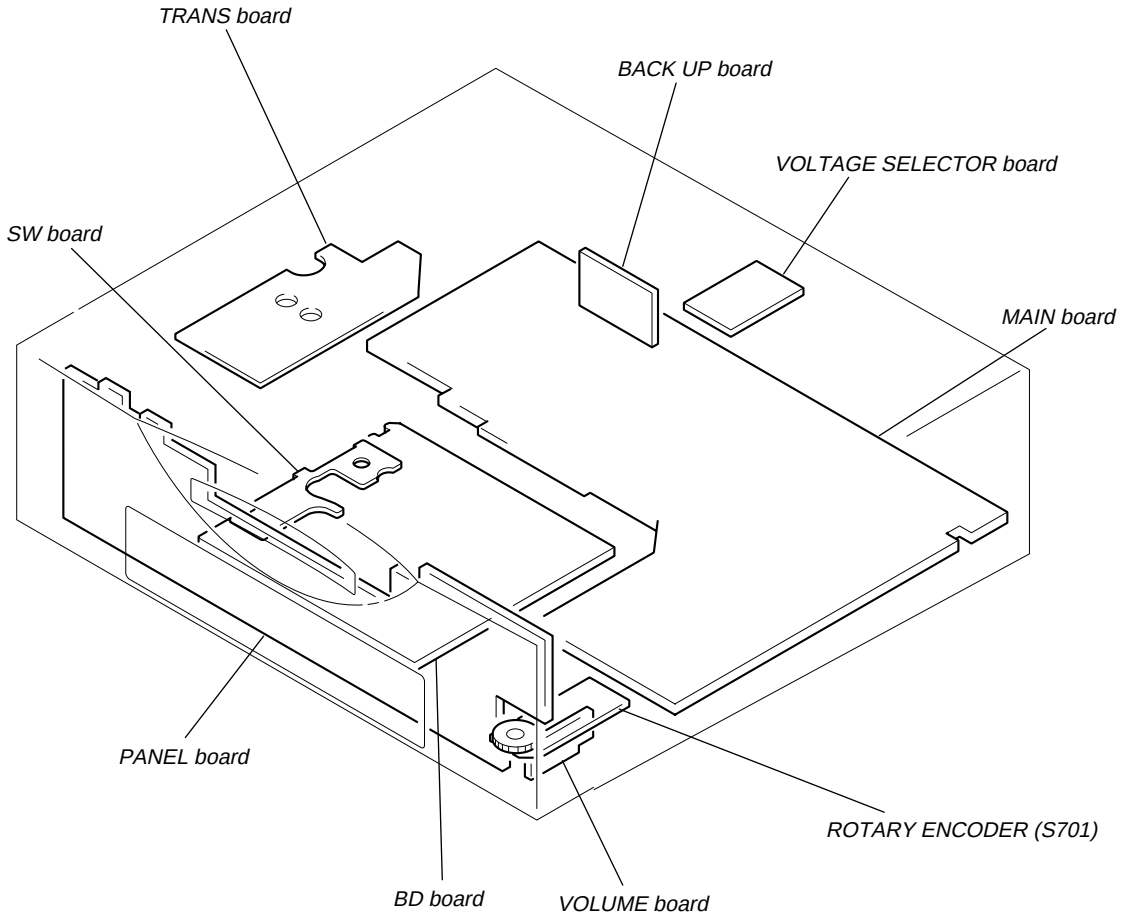
[BD BOARD] (SIDE B)



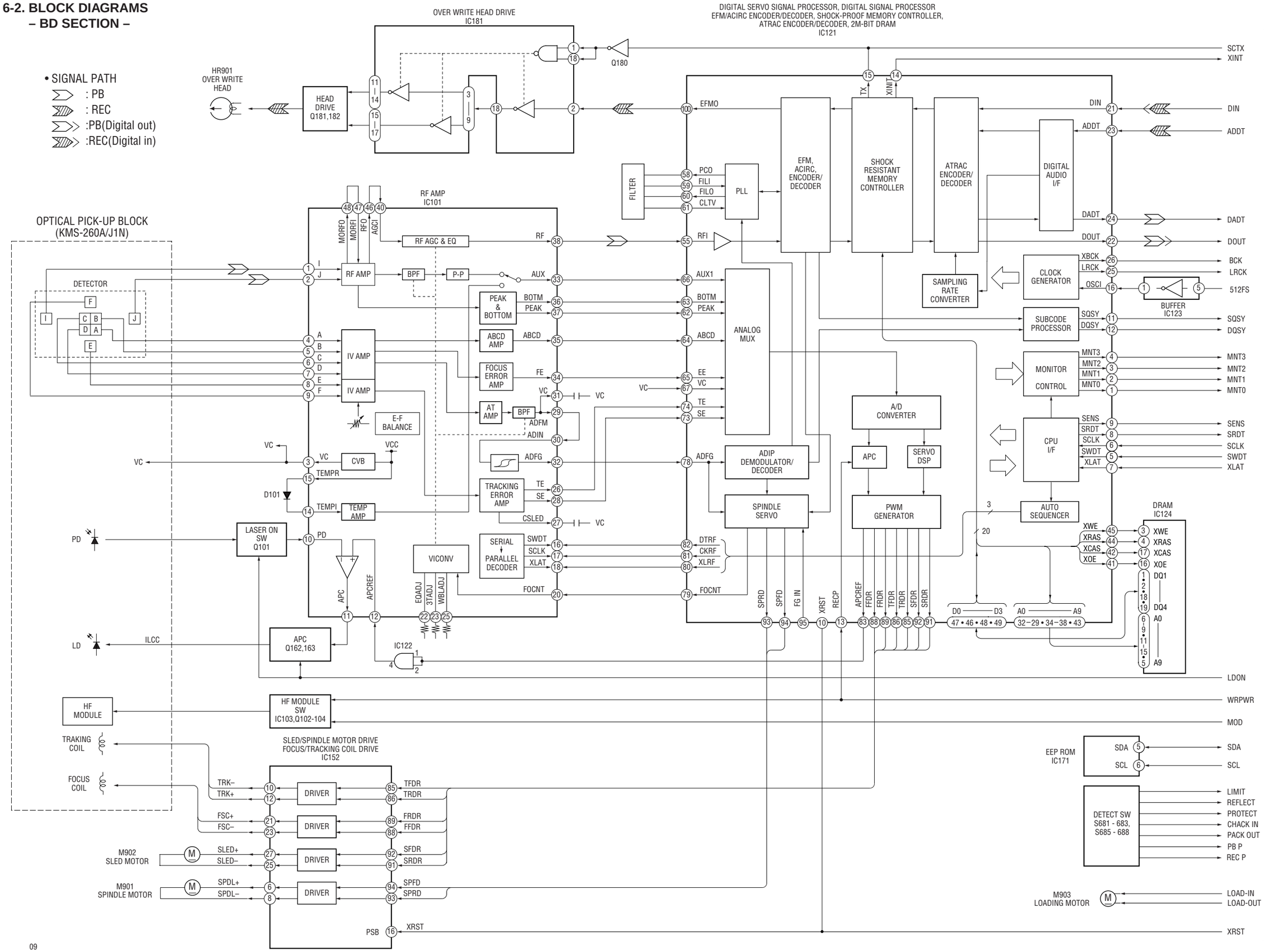
NOTE: It is useful to use the jig. for checking the waveform. (Refer to Servicing Note on page 6.)

SECTION 6
DIAGRAMS

6-1. CIRCUIT BOARDS LOCATION

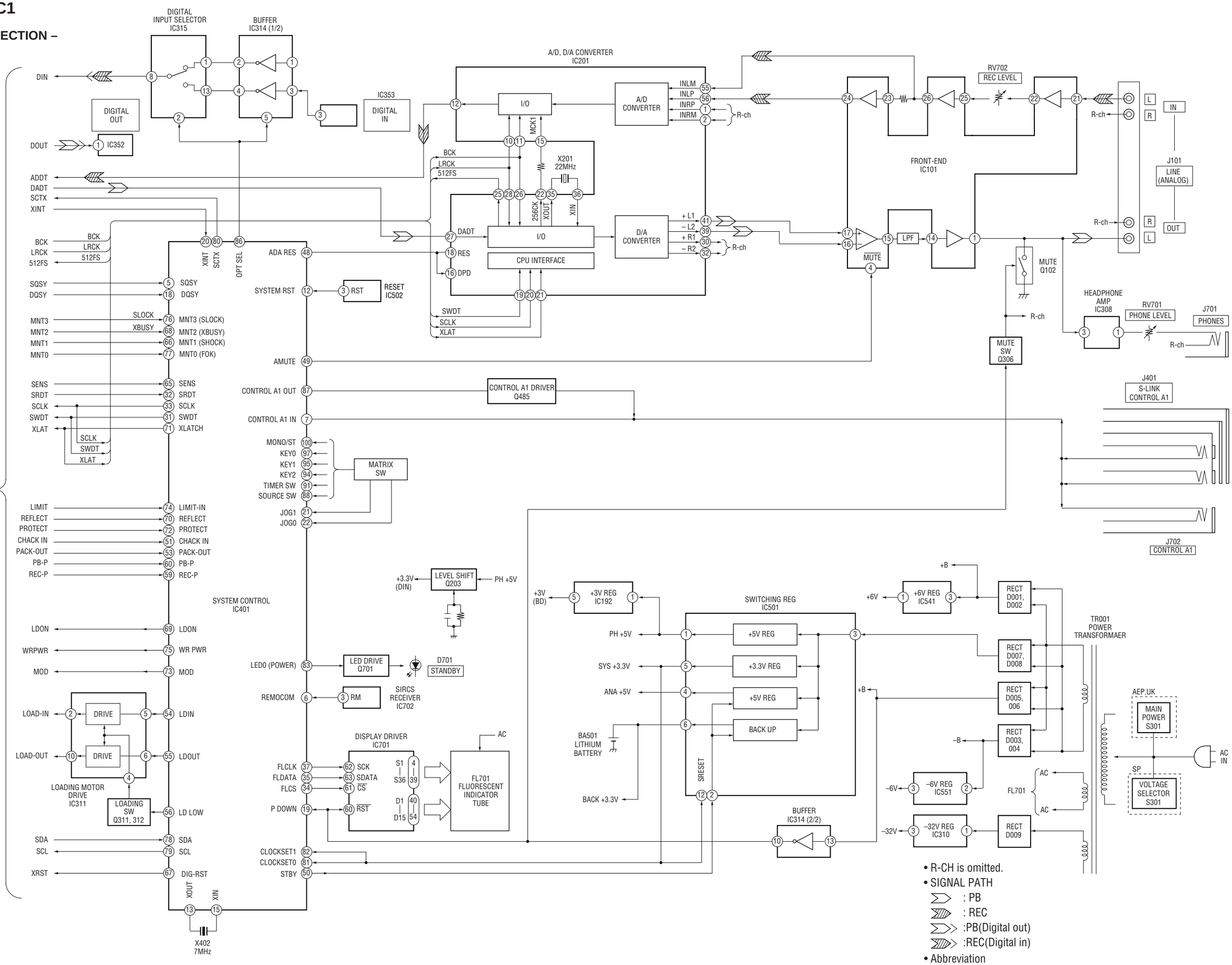


6-2. BLOCK DIAGRAMS – BD SECTION –



MDS-PC1

– MAIN SECTION –



- R-CH is omitted.
- SIGNAL PATH
  - : PB
  - : REC
  - :PB(Digital out)
  - :REC(Digital in)
- Abbreviation
  SP :Singapore model.

09

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For schematic diagrams.

Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- ▭ : panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- B+ : B+ Line.
- B− : B– Line.
- ▭ : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : STOP
  ( ) : PLAY
  < > : REC
  ✻ : Can not be measured.
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  : PB
  : REC
  : PB (DIGITAL OUT)
  : REC (DIGITAL IN)
- Abbreviation
  SP : Singapore model.

For printed wiring boards.

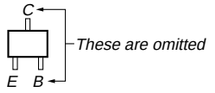
Note:

- ○——— : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ■ : parts mounted on the conductor side.
- ○ : Through hole.
- ▒ : Pattern from the side which enables seeing. (The other layers' patterns are not indicated.)

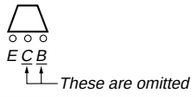
Caution:
Pattern face side: (Side B) Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A) Parts on the parts face side seen from the parts face are indicated.

- **Indication of transistor**

- **Indication of transistor**



- **Indication of transistor**



WAVEFORMS

– BD SECTION –

① 0.46Vp-p
IC101 ①, ② I, J (PLAY mode)

② 0.1Vp-p
IC101 ④ A (PLAY mode)

③ 0.06Vp-p
IC101 ⑧, ⑨ E, F (PLAY mode)

④ 3.1Vp-p
22.581MHz
IC121 ⑯ OSCI

⑤ 3.2Vp-p
44.1kHz
IC121 ㉕ LRCK

⑥ 3.8Vp-p
2.822MHz
IC121 ㉖ XBCK

⑦ 3.8Vp-p
11.29MHz
IC121 ㉗ FS256

⑧ 3.2Vp-p
176.4kHz
IC121 ㊿ FS4

– MAIN SECTION –

① 3.4Vp-p
7MHz
IC401 ⑬ XOUT

② 3.3Vp-p
44.1kHz
IC201 ⑩ LRCK1, ㉘ LRCK

③ 3.6Vp-p
2.822MHz
IC201 ⑪ BCK1, ㉖ BCK

④ 5.6Vp-p
22.553MHz
IC201 ⑮ MCK1, ㉒ 256CK

⑤ 2.9Vp-p
22.578MHz
IC201 ㉕ 512FS

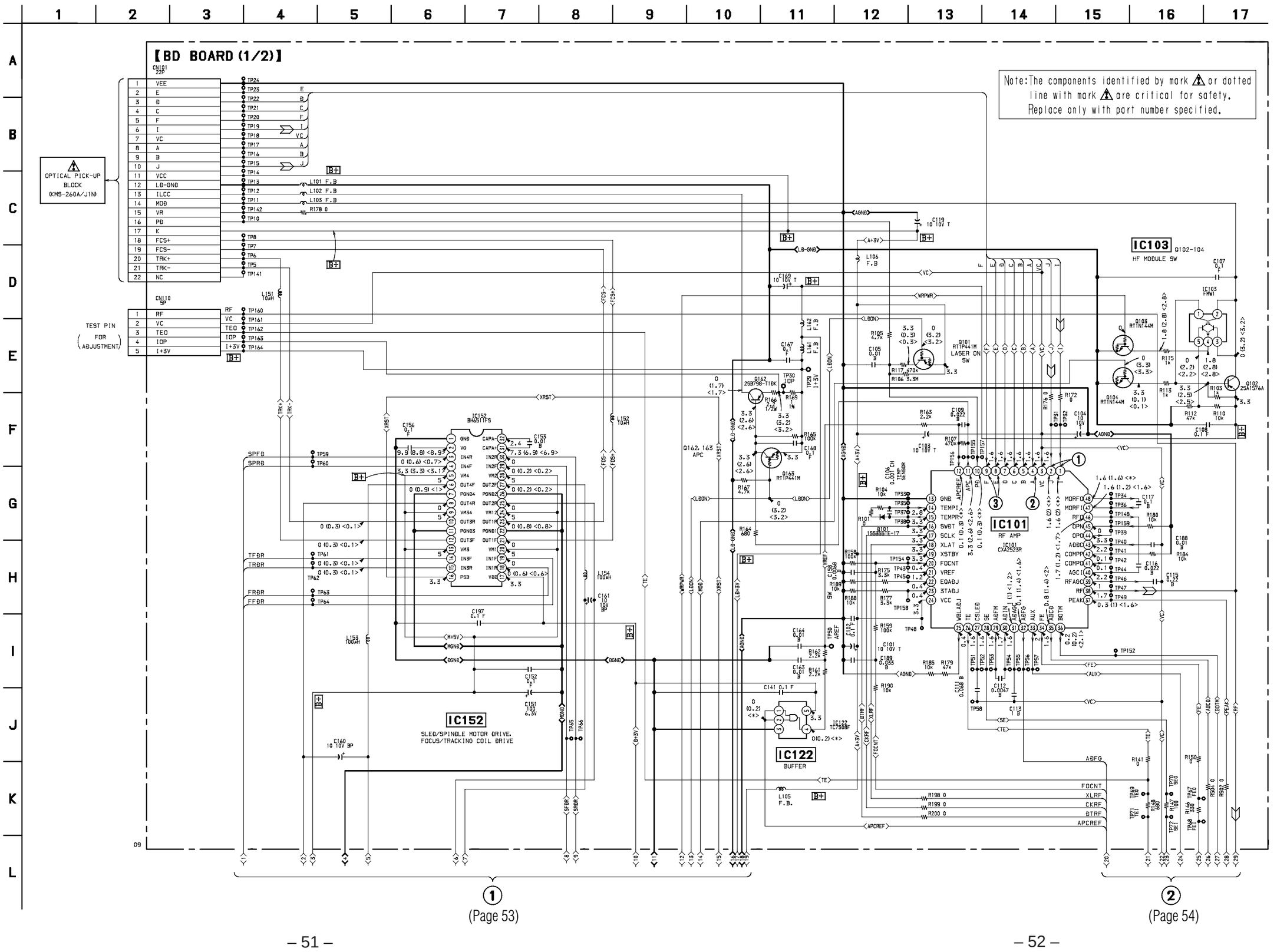
⑥ 5Vp-p
22.58MHz
IC201 ㉟ XOUT

– PANEL SECTION –

① 3.7Vp-p
2.361MHz
IC701 ㊾ OSC1

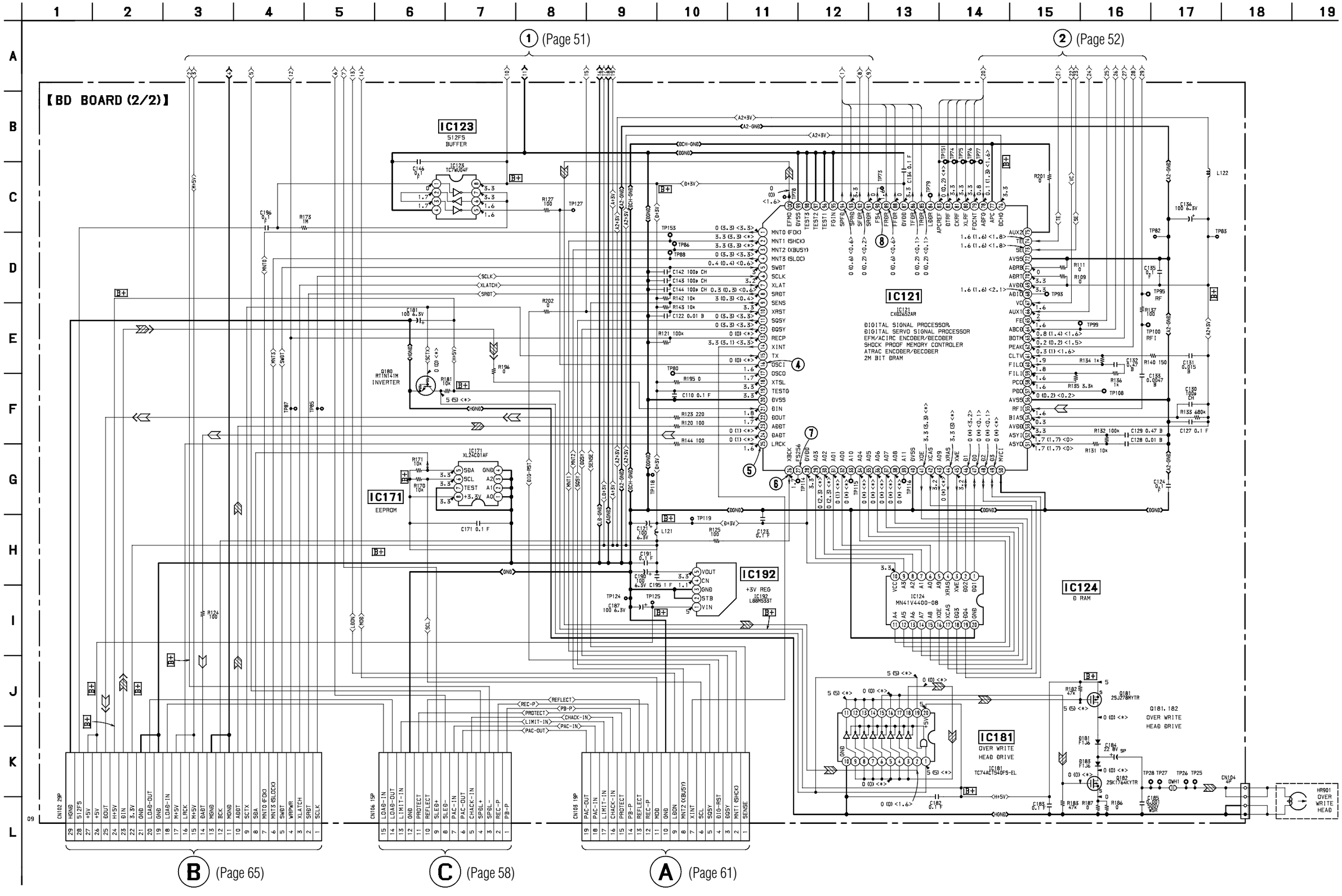
6-3. SCHEMATIC DIAGRAM – BD (1/2) SECTION –

- See page 50 for Waveforms.
- See page 55 for Printed Wiring Board.
- See page 71 for IC Block Diagrams.
- See page 76 for IC Pin Functions.



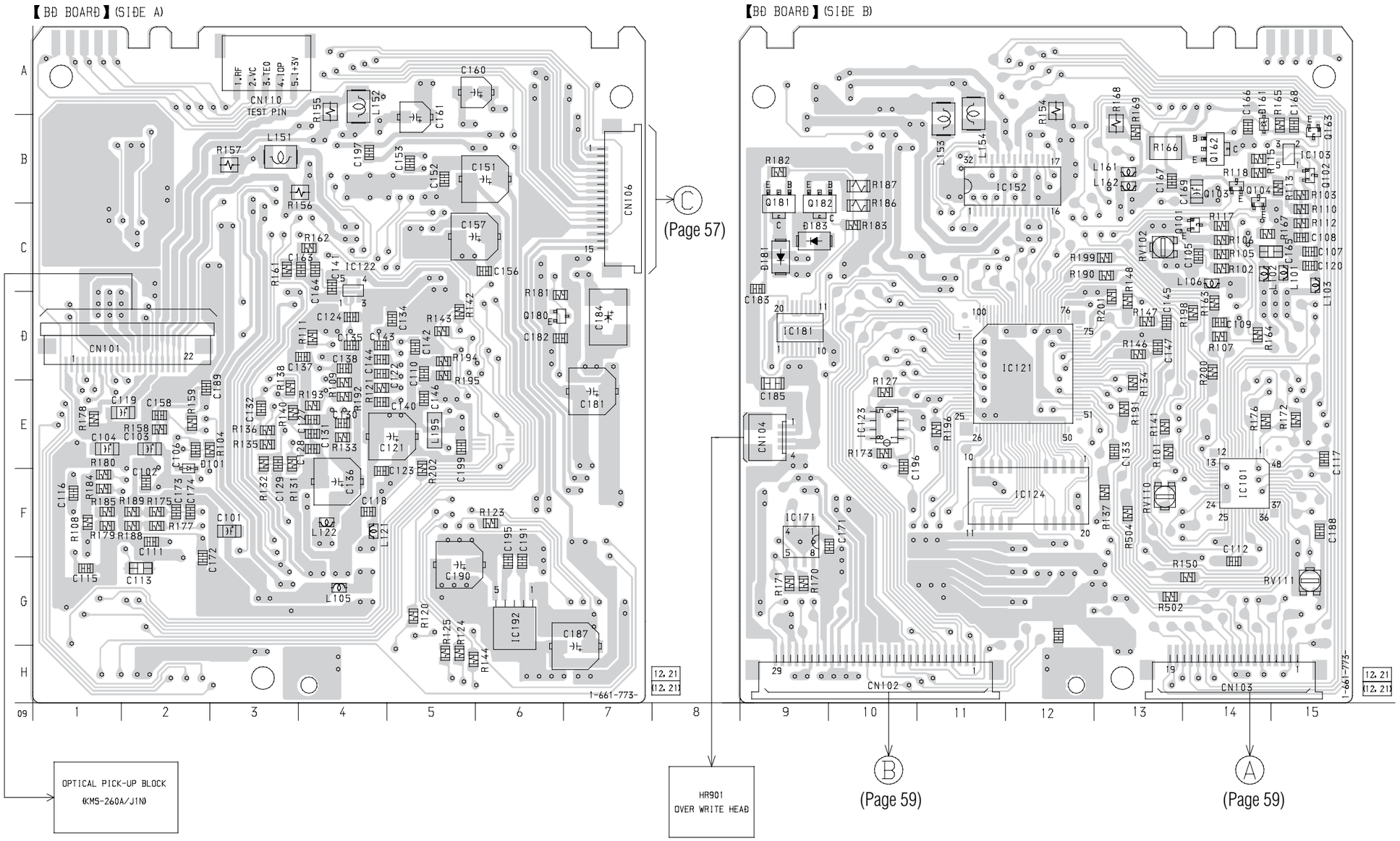
6-4. SCHEMATIC DIAGRAM – BD (2/2) SECTION –

- See page 50 for Waveforms.
- See page 55 for Printed Wiring Board.
- See page 72 for IC Block Diagrams.
- See page 77 for IC Pin Functions.



6-5. PRINTED WIRING BOARD – BD SECTION –

• See page 43 for Circuit Boards Location.

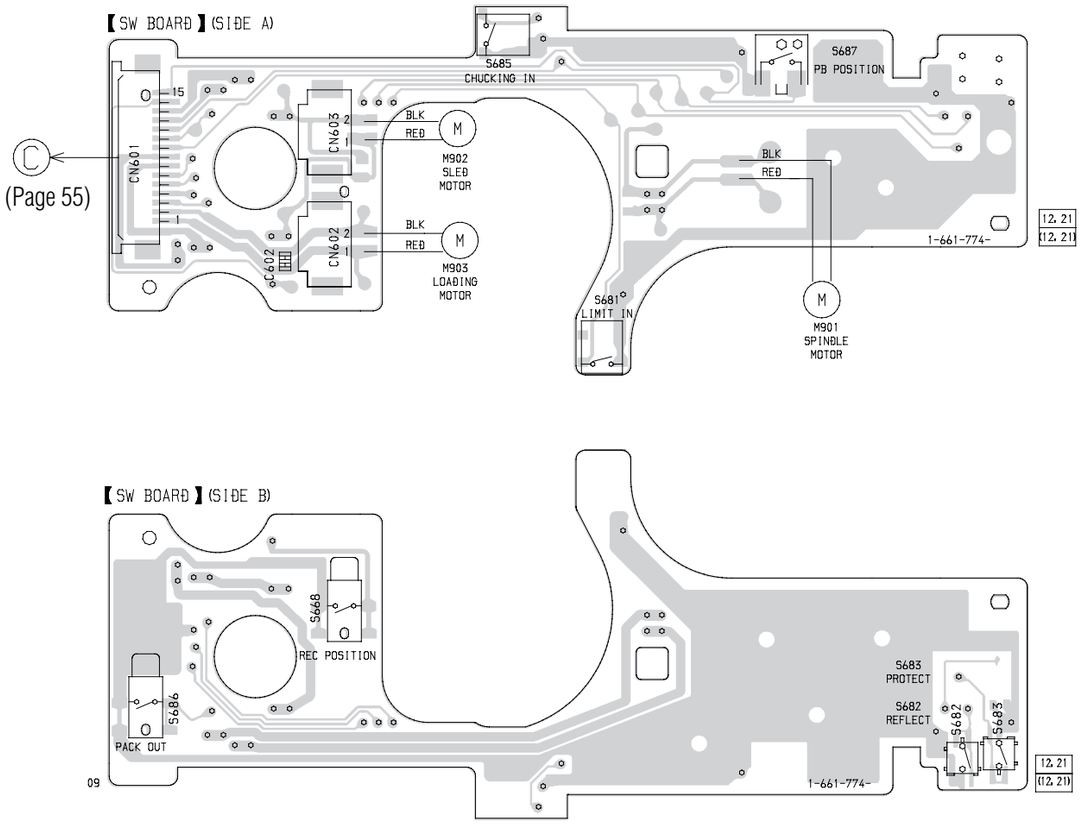


• **Semiconductor Location**

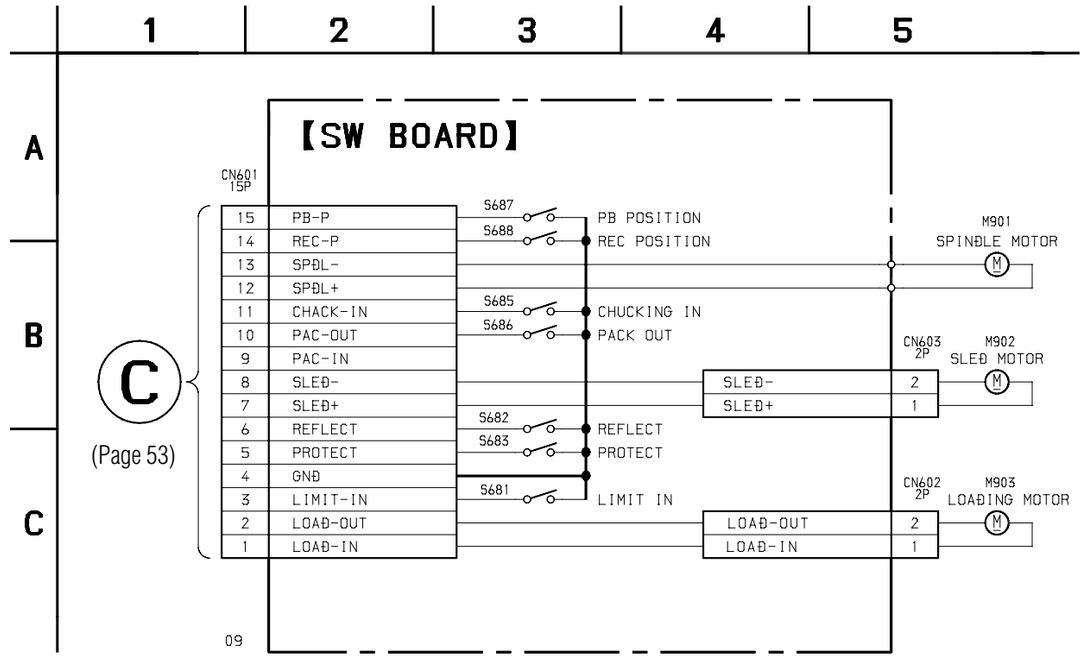
Ref. No.	Location
D101	E-3
D181	C-9
D183	C-9
IC101	F-14
IC103	B-15
IC121	D-12
IC122	C-4
IC123	E-10
IC124	F-12
IC152	B-12
IC171	F-9
IC181	D-9
IC192	G-6
Q101	C-14
Q102	B-15
Q103	B-14
Q104	B-14
Q162	B-14
Q163	B-15
Q180	D-6
Q181	B-9
Q182	B-9

6-6. PRINTED WIRING BOARD – SW SECTION –

• See page 43 for Circuit Boards Location.

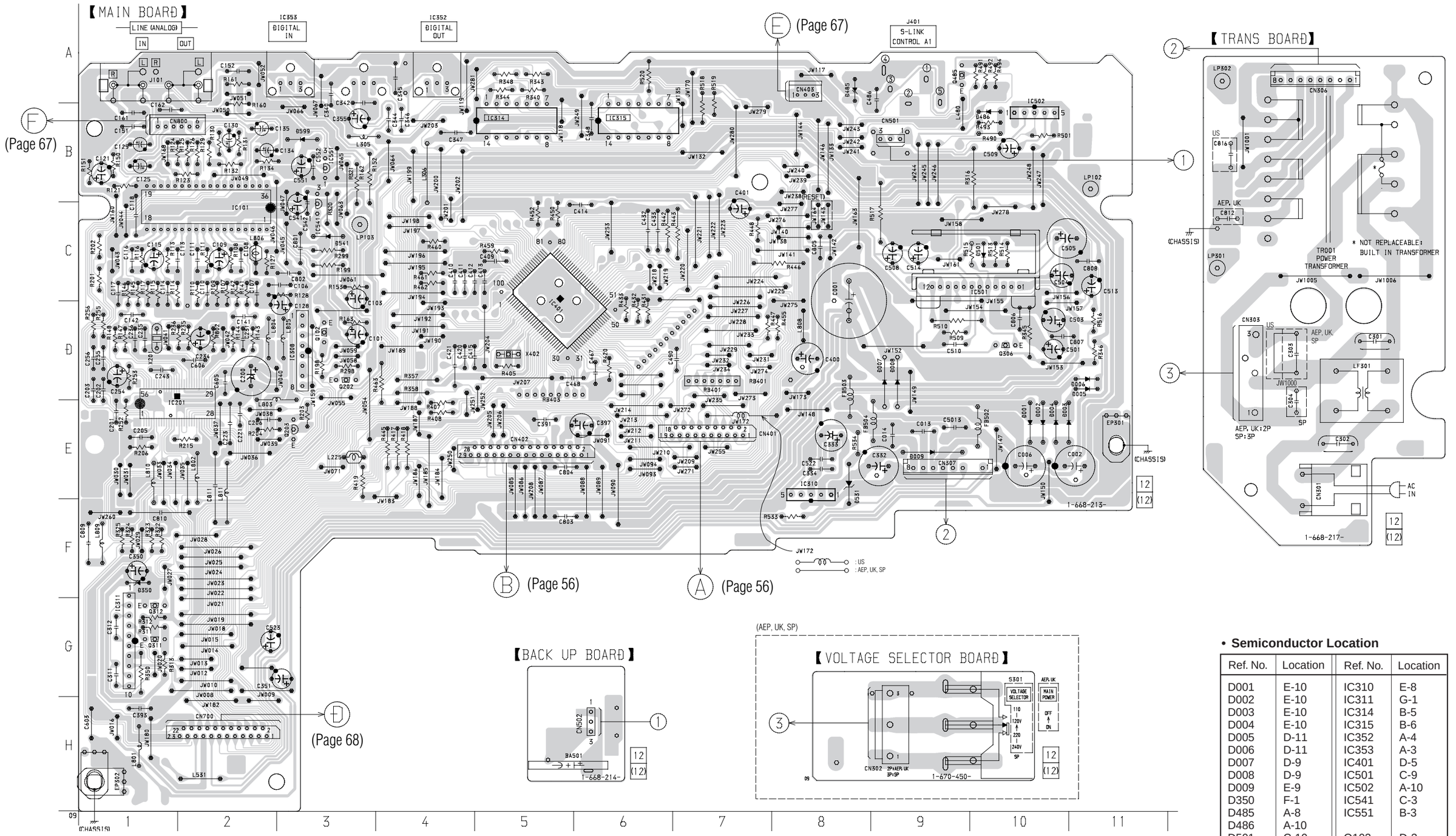


6-7. SCHEMATIC DIAGRAM – SW SECTION –



6-8. PRINTED WIRING BOARD – MAIN SECTION –

• See page 43 for Circuit Boards Location.

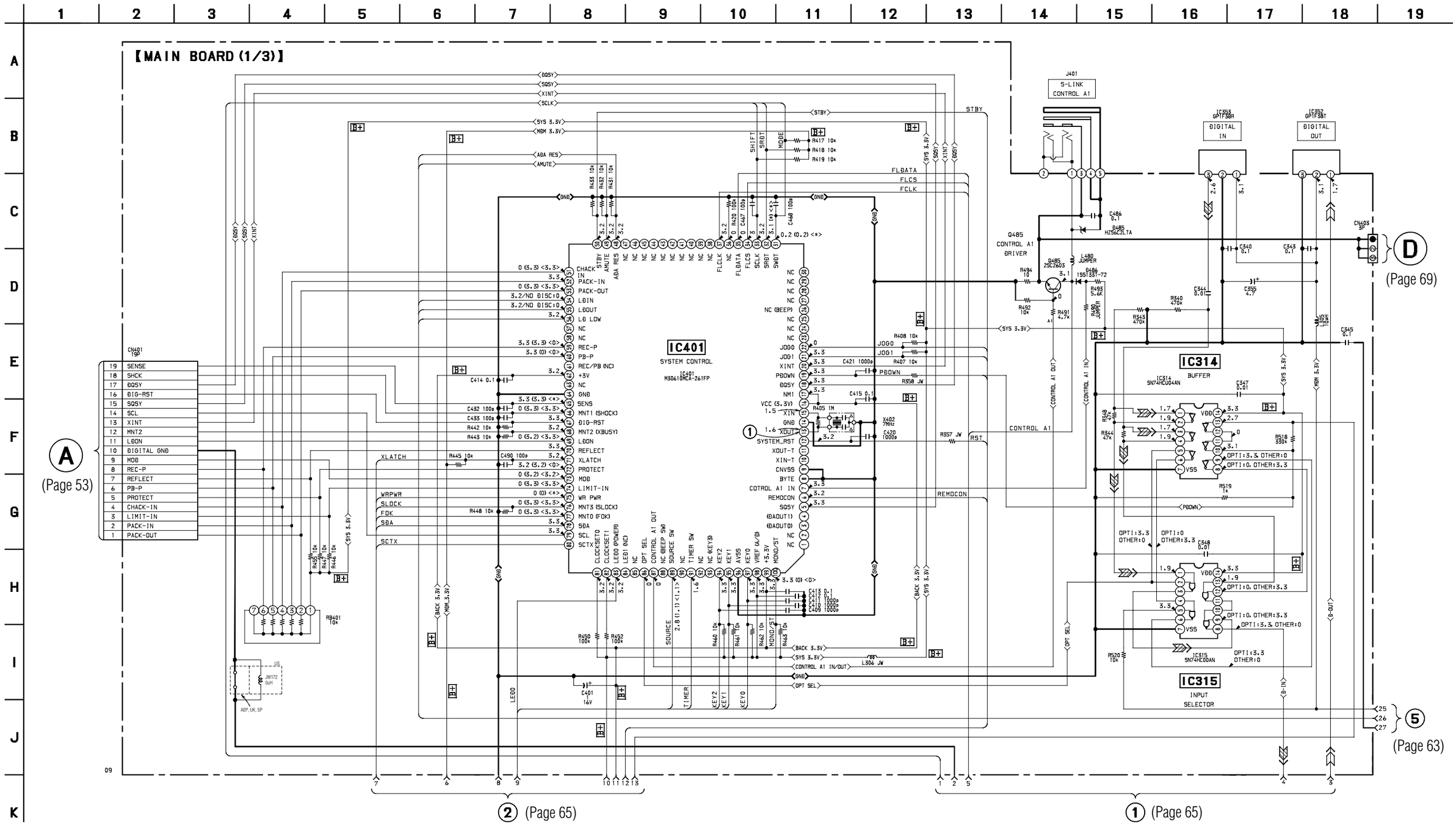


• **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D001	E-10	IC310	E-8
D002	E-10	IC311	G-1
D003	E-10	IC314	B-5
D004	E-10	IC315	B-6
D005	D-11	IC352	A-4
D006	D-11	IC353	A-3
D007	D-9	IC401	D-5
D008	D-9	IC501	C-9
D009	E-9	IC502	A-10
D350	F-1	IC541	C-3
D485	A-8	IC551	B-3
D486	A-10		
D501	C-10	Q102	D-3
D531	E-8	Q202	D-3
D541	C-3	Q203	E-3
D599	B-3	Q306	D-10
		Q311	G-1
IC101	C-2	Q312	G-1
IC201	E-2	Q485	A-9
IC308	D-3		

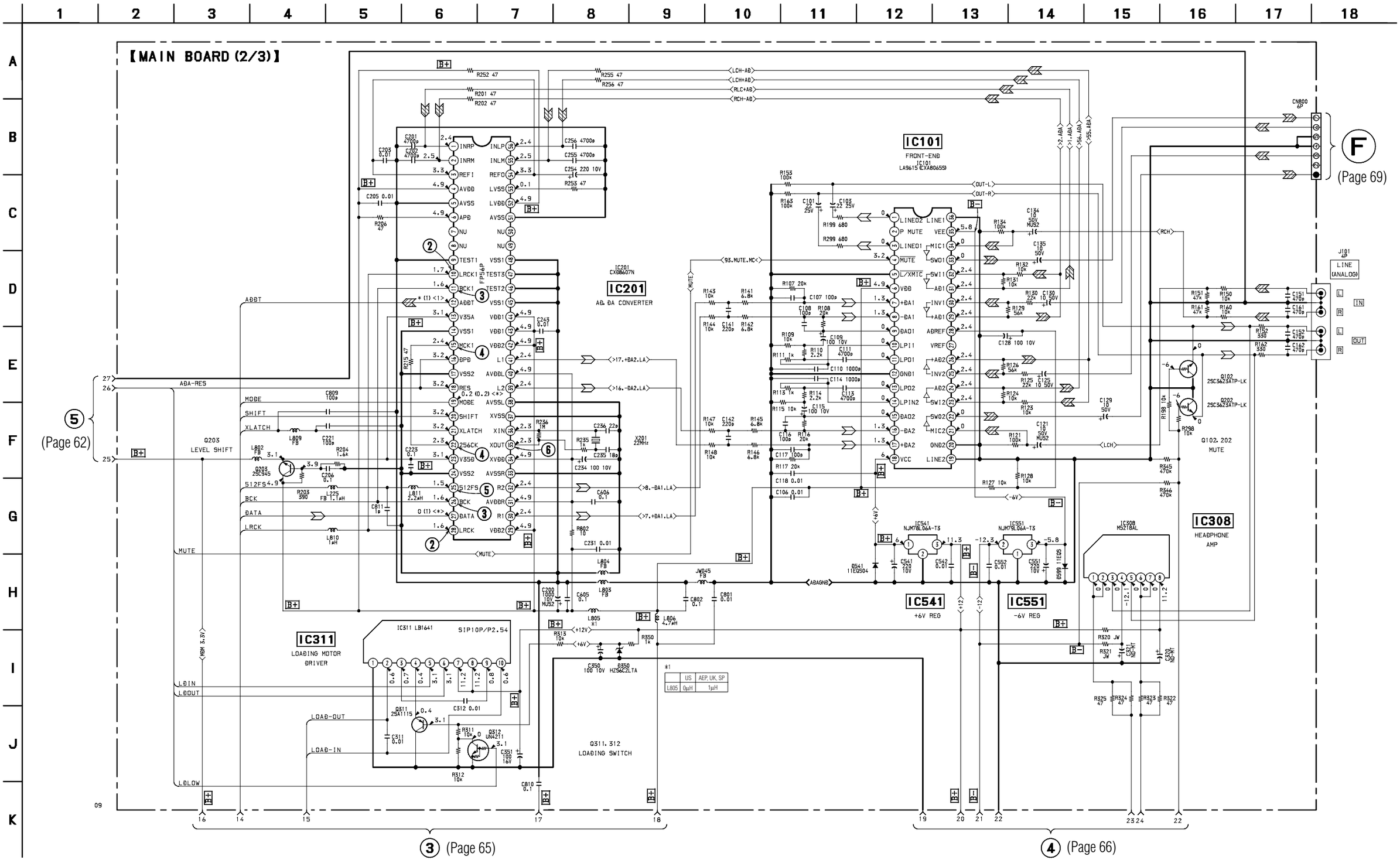
6-9. SCHEMATIC DIAGRAM – MAIN (1/3) SECTION –

- See page 50 for Waveforms.
- See page 82 for IC Pin Functions.



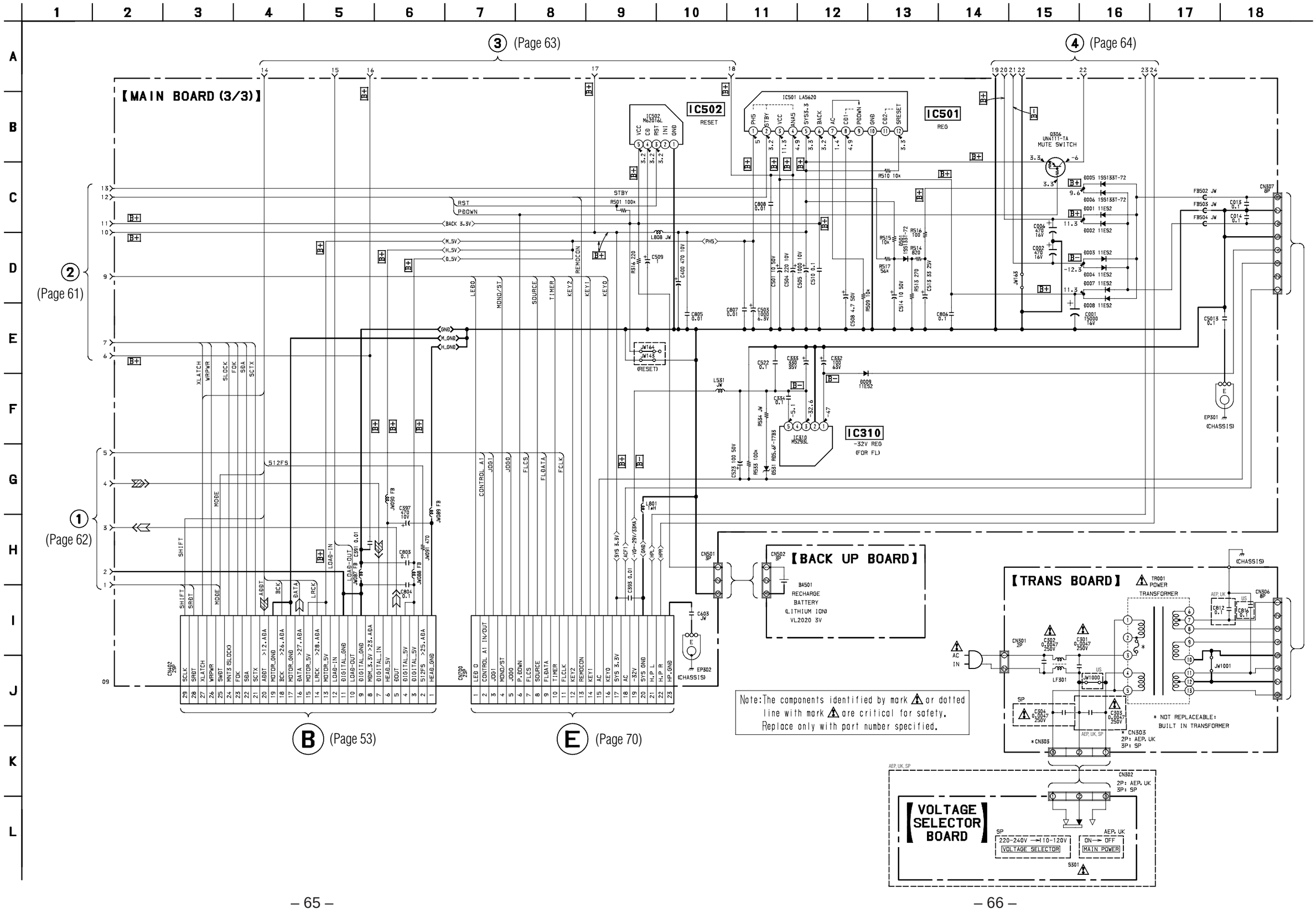
6-10. SCHEMATIC DIAGRAM – MAIN (2/3) SECTION –

- See page 50 for Waveforms.
- See page 59 for Printed Wiring Board.
- See page 73 for IC Block Diagrams.
- See page 80 for IC Pin Functions.



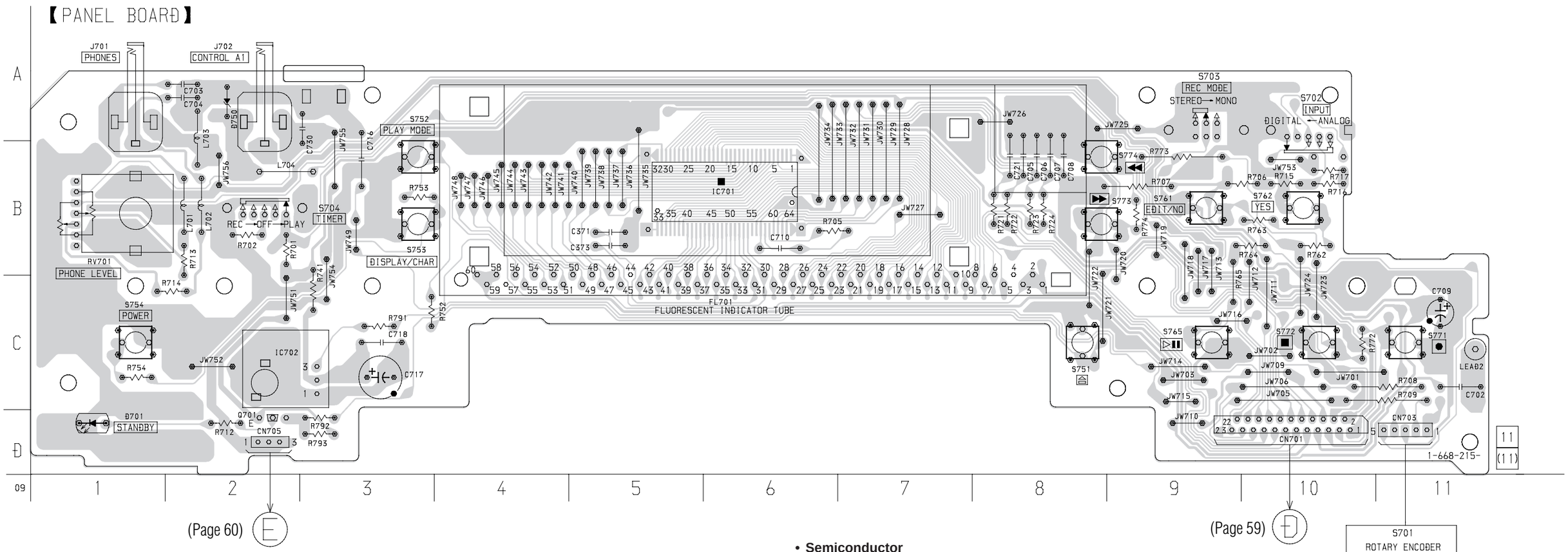
6-11. SCHEMATIC DIAGRAM – MAIN (3/3) SECTION –

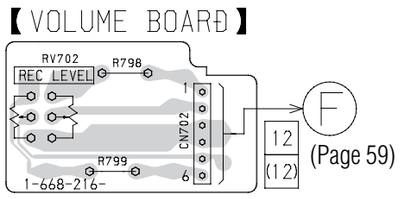
- See page 50 for Waveforms.
- See page 59 for Printed Wiring Board.
- See page 75 for IC Block Diagrams.



6-12. PRINTED WIRING BOARD – PANEL SECTION –

• See page 43 for Circuit Boards Location.



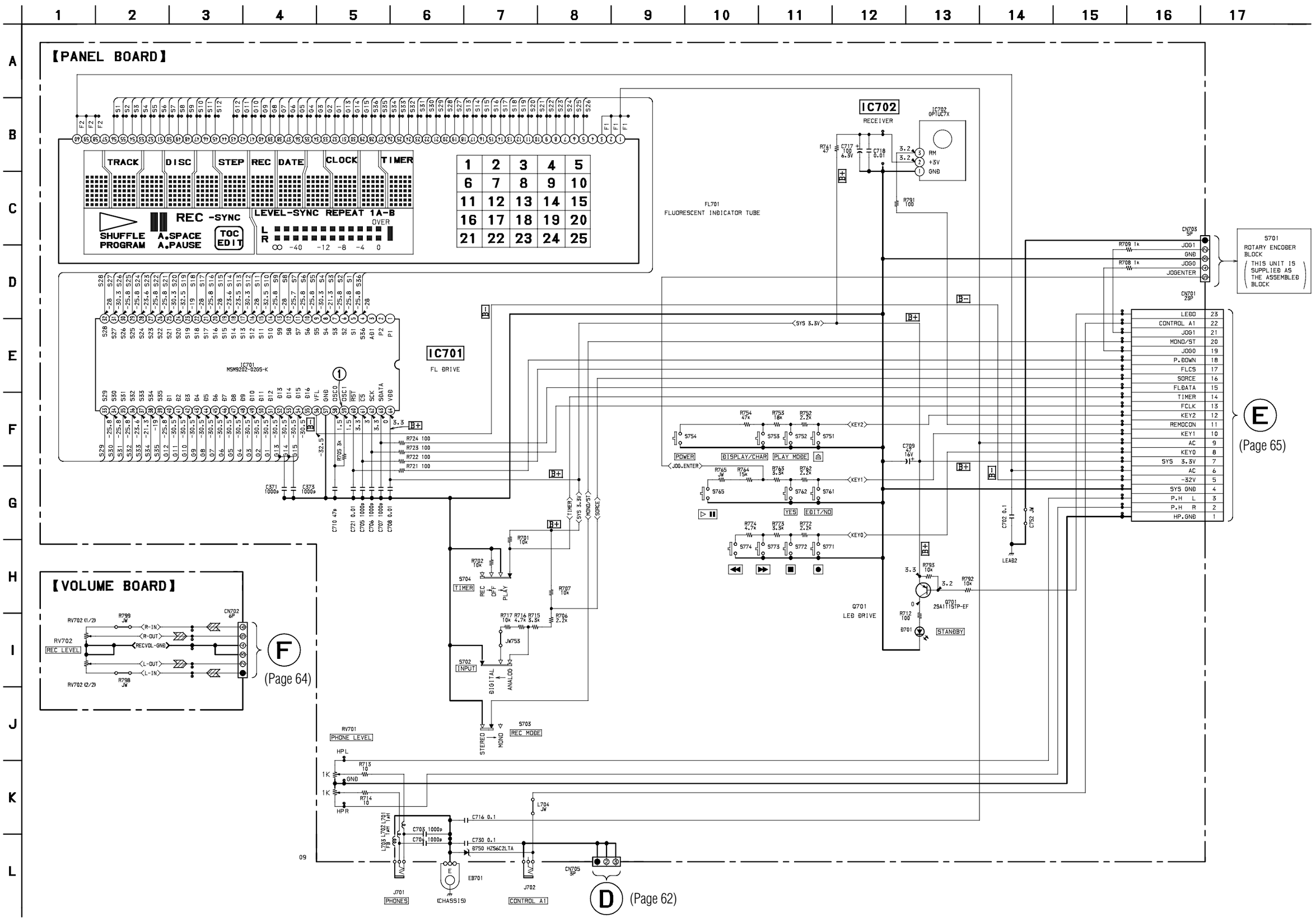


• **Semiconductor Location**

Ref. No.	Location
D701	D-1
D750	A-2
IC701	B-6
IC702	C-2
Q701	D-2

6-13. SCHEMATIC DIAGRAM – PANEL SECTION –

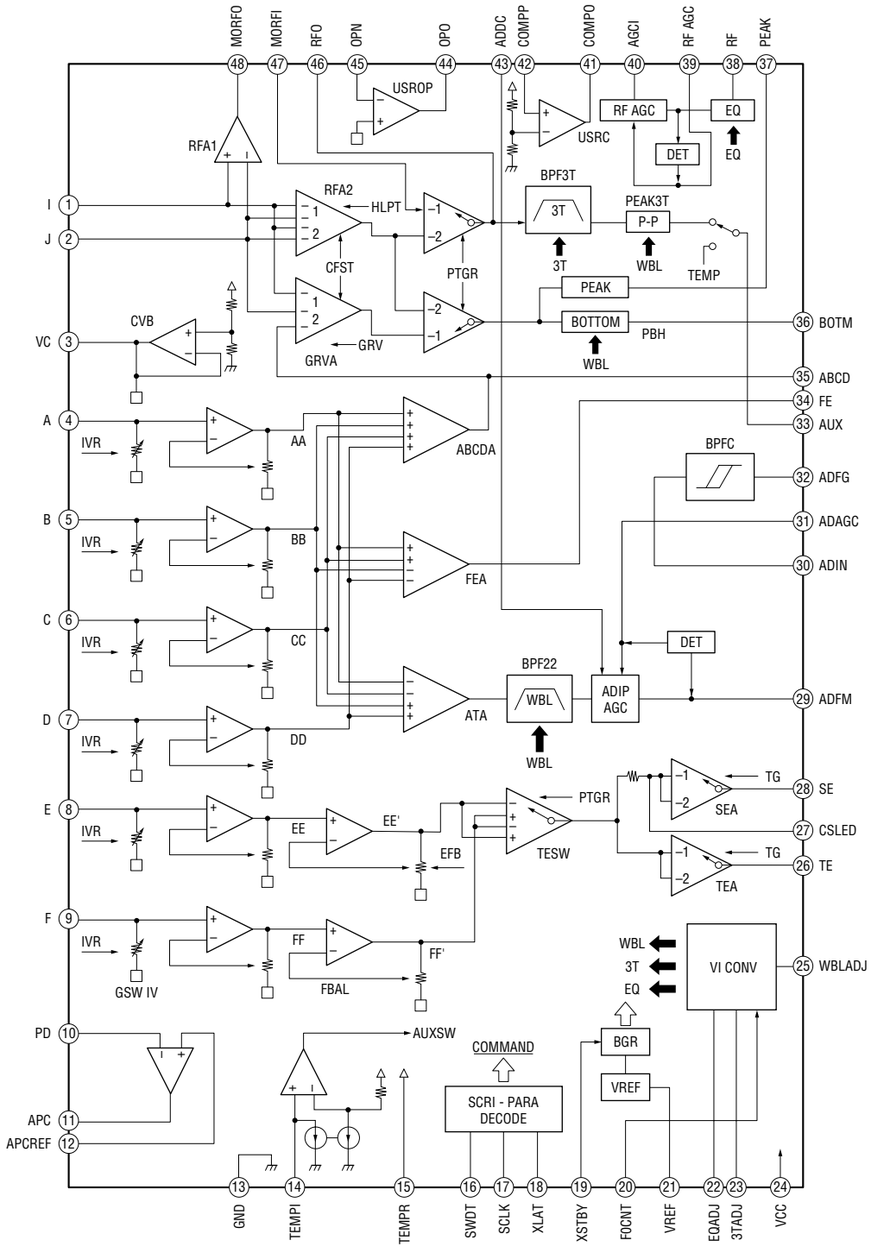
• See page 50 for Waveforms.



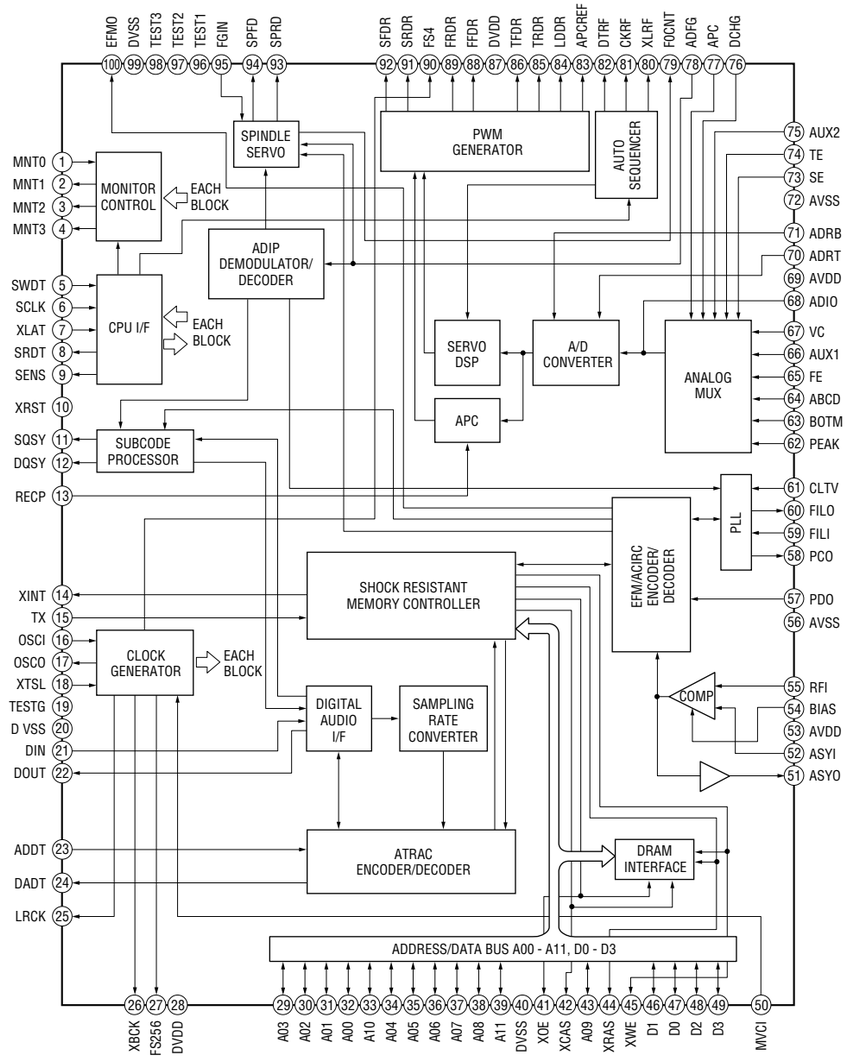
6-14. IC BLOCK DIAGRAMS

• BD section

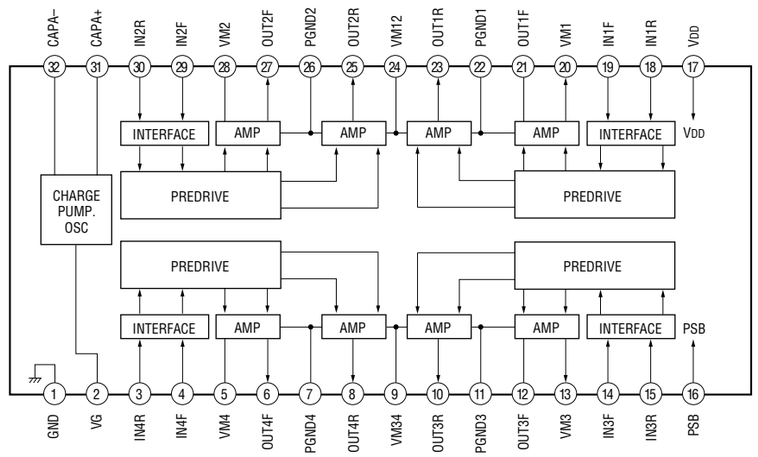
IC101 CXA2523AR



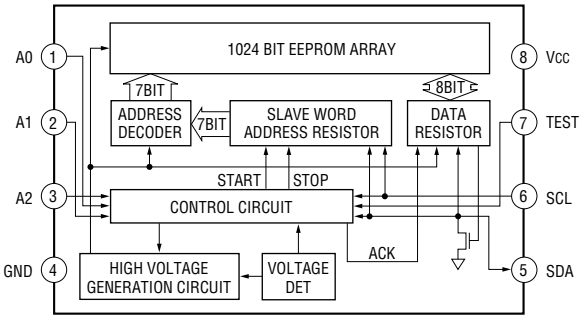
IC121 CXD2652AR



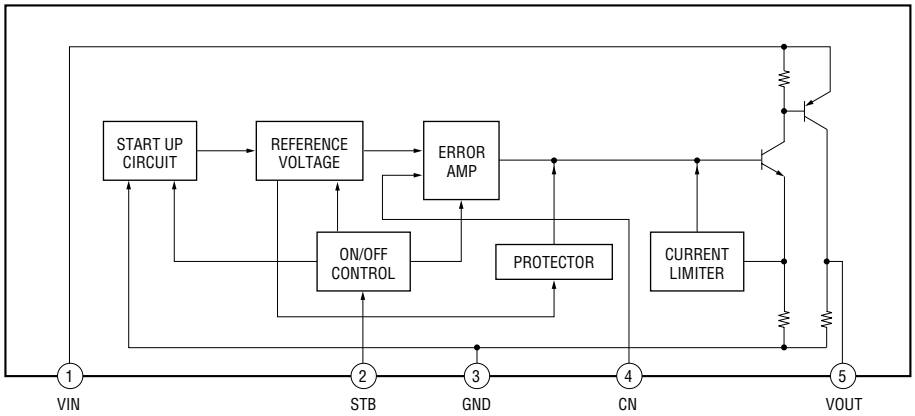
IC152 BH6511FS-E2



IC171 BR24C01AF

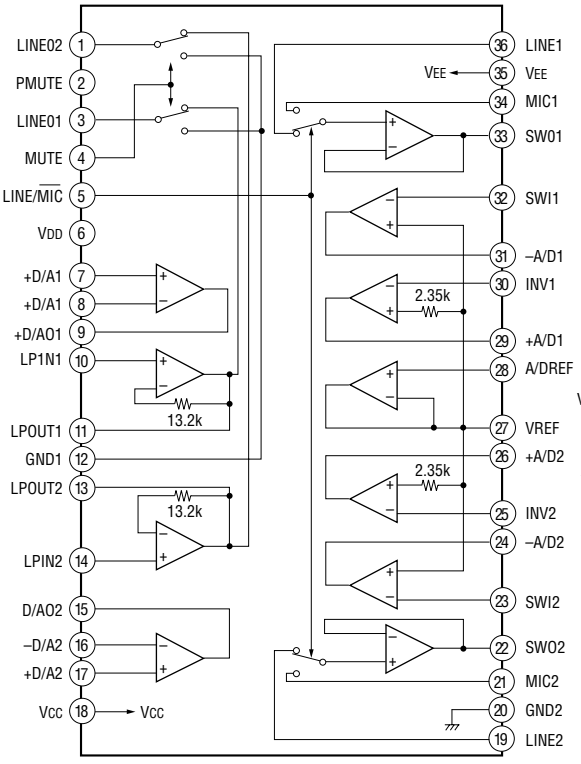


IC192 L88MS33T-TL

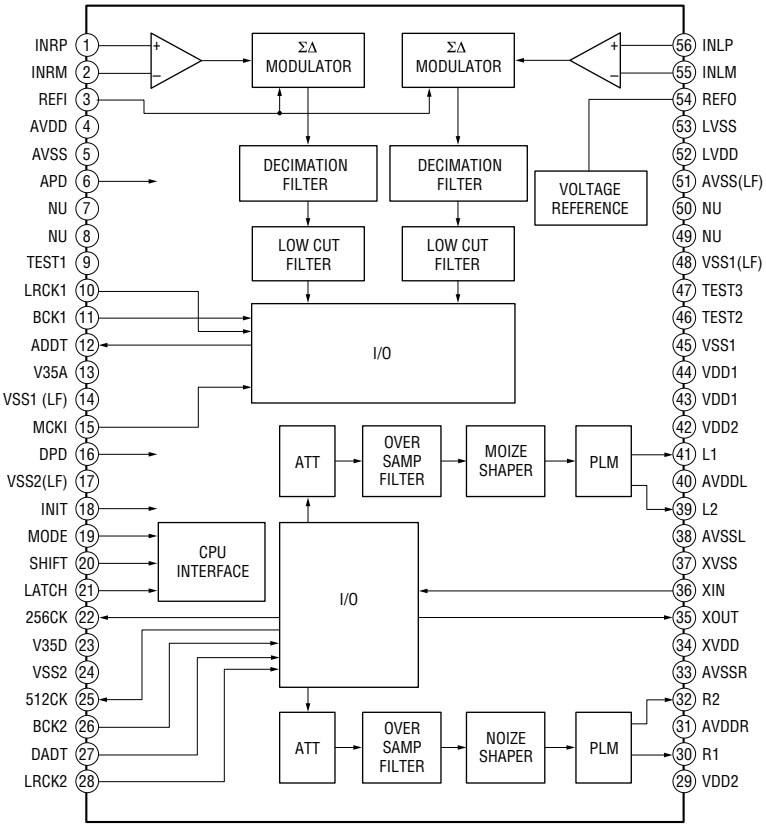


• MAIN section

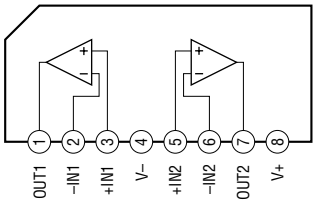
IC101 LA9615



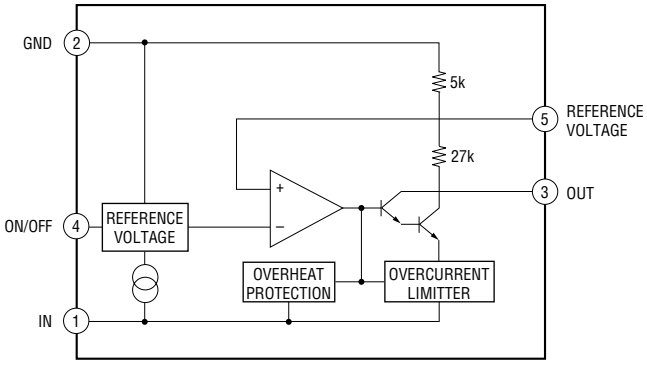
IC201 CXD8607N



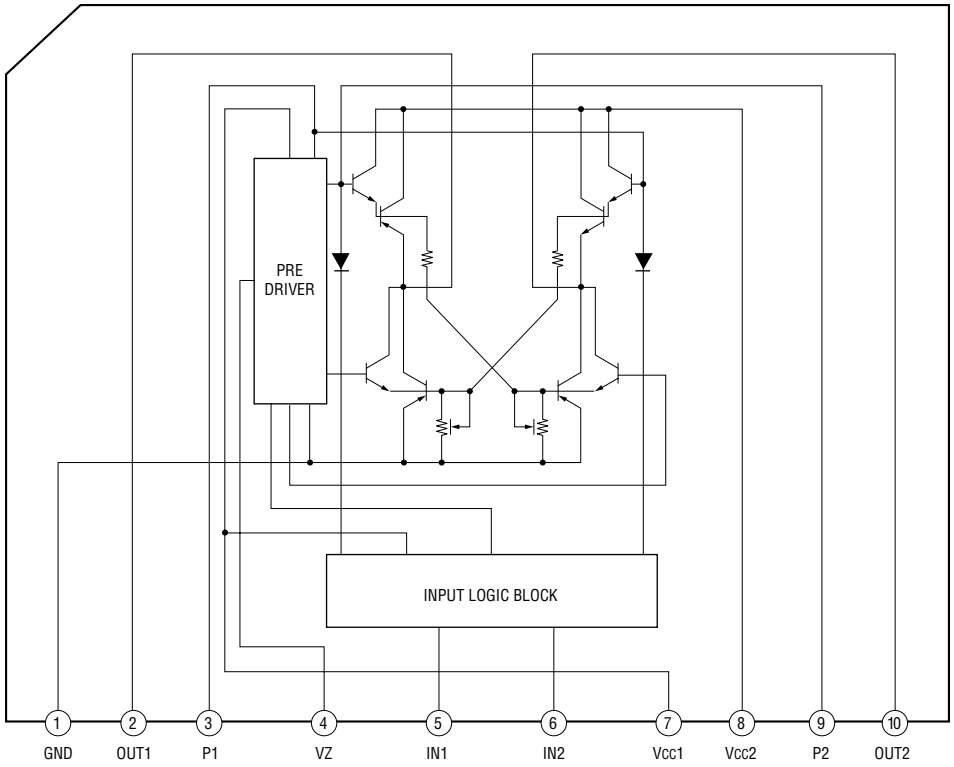
IC308 M5218AL



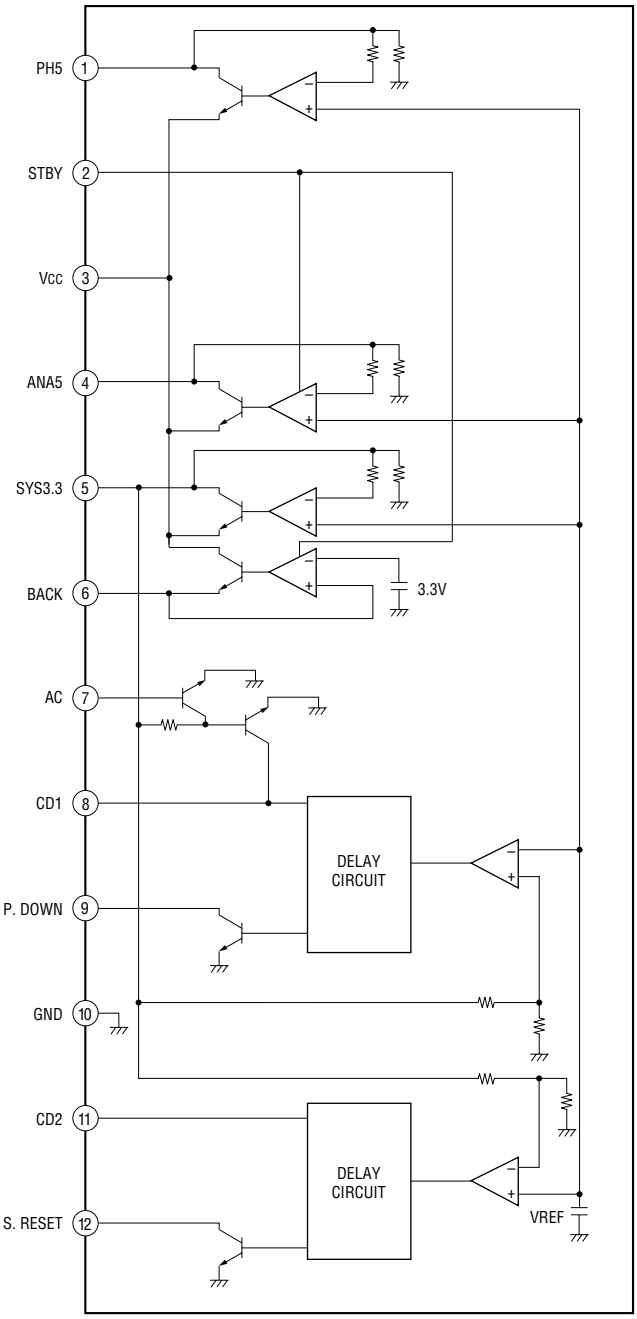
IC310 M5293L



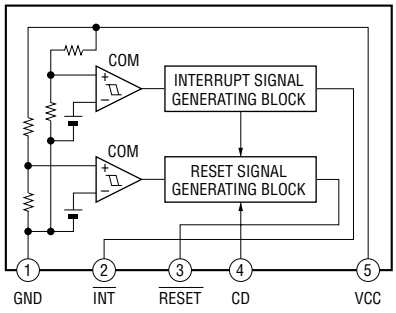
IC311 LB1641



IC501 LA5620



IC502 M62016L



6-15. IC PIN FUNCTIONS

• IC101 RF Amplifier (CXA2523R) (BD Board)

Pin No.	Pin Name	I/O	Function
1	I	I	I-V converted RF signal I input
2	J	I	I-V converted RF signal J input
3	VC	O	Middle point voltage (+1.5V) generation output
4 to 9	A to F	I	Signal input from the optical pick-up detector
10	PD	I	Light amount monitor input
11	APC	O	Laser APC output
12	APCREF	I	Reference voltage input for setting laser power
13	GND	—	Ground
14	TEMPI	I	Temperature sensor connection
15	TEMPR	O	Reference voltage output for the temperature sensor
16	SWDT	I	Serial data input from the CXD2652AR
17	SCLK	I	Serial clock input from the CXD2652AR
18	XLAT	I	Latch signal input from the CXD2652AR “L”: Latch
19	XSTBY	I	Stand by signal input “L”: Stand by
20	F0CNT	I	Center frequency control voltage input of BPF22, BPF3T, EQ from the CXD2652AR
21	VREF	O	Reference voltage output (Not used)
22	EQADJ	I/O	Center frequency setting pin for the internal circuit EQ
23	3TADJ	I/O	Center frequency setting pin for the internal circuit BPF3T
24	Vcc	—	+3V power supply
25	WBLADJ	I/O	Center frequency setting pin for the internal circuit BPF22
26	TE	O	Tracking error signal output to the CXD2652AR
27	CSLED	—	External capacitor connection pin for the sled error signal LPF
28	SE	O	Sled error signal output to the CXD2652AR
29	ADFM	O	FM signal output of ADIP
30	ADIN	I	ADIP signal comparator input ADFM is connected with AC coupling
31	ADAGC	—	External capacitor connection pin for AGC of ADIP
32	ADFG	O	ADIP duplex signal output to the CXD2652AR
33	AUX	O	I3 signal/temperature signal output to the CXD2652AR (Switching with a serial command)
34	FE	O	Focus error signal output to the CXD2652AR
35	ABCD	O	Light amount signal output to the CXD2652AR
36	BOTM	O	RF/ABCD bottom hold signal output to the CXD2652AR
37	PEAK	O	RF/ABCD peak hold signal output to the CXD2652AR
38	RF	O	RF equalizer output to the CXD2652AR
39	RFAGC	—	External capacitor connection pin for the RF AGC circuit
40	AGCI	I	Input to the RF AGC circuit The RF amplifier output is input with AC coupling
41	COMPO	O	User comparator output (Not used)
42	COMPP	I	User comparator input (Fixed at “L”)
43	ADDC	I/O	External capacitor pin for cutting the low band of the ADIP amplifier
44	OPO	O	User operation amplifier output (Not used)
45	OPN	I	User operation amplifier inversion input (Fixed at “L”)
46	RFO	O	RF amplifier output
47	MORFI	I	Groove RF signal is input with AC coupling
48	MORFO	O	Groove RF signal output

• Abbreviation
APC: Auto Power Control
AGC: Auto Gain Control

• **IC121 Digital Signal Processor, Digital Servo Signal Processor, EFM/ACIRC Encoder/Decoder, Shock-proof Memory Controller, ATRAC Encoder/Decoder, 2M Bit DRAM (CXD2652AR) (BD Board)**

Pin No.	Pin Name	I/O	Function
1	MNT0 (FOK)	O	FOK signal output to the system control "H" is output when focus is on
2	MNT1 (SHCK)	O	Track jump detection signal output to the system control
3	MNT2 (XBUSY)	O	Monitor 2 output to the system control
4	MNT3 (SLOC)	O	Monitor 3 output to the system control
5	SWDT	I	Writing data signal input from the system control
6	SCLK	I (S)	Serial clock signal input from the system control
7	XLAT	I (S)	Serial latch signal input from the system control
8	SRDT	O (3)	Reading data signal output to the system control
9	SENS	O (3)	Internal status (SENSE) output to the system control
10	XRST	I (S)	Reset signal input from the system control "L": Reset
11	SQSY	O	Subcode Q sync (SCOR) output to the system control "L" is output every 13.3 msec. Almost all, "H" is output
12	DQSY	O	Digital In U-bit CD format subcode Q sync (SCOR) output to the system control "L" is output every 13.3 msec Almost all, "H" is output
13	RECP	I	Laser power switching input from the system control "H": Recording, "L": Playback
14	XINT	O	Interrupt status output to the system control
15	TX	I	Recording data output enable input from the system control
16	OSCI	I	System clock input (512Fs=22.5792 MHz)
17	OSCO	O	System clock output (512Fs=22.5792 MHz) (Not used)
18	XTSL	I	System clock frequency setting "L": 45.1584 MHz, "H": 22.5792 MHz (Fixed at "H")
19	DVDD	—	+3V power supply (Digital)
20	DVSS	—	Ground (Digital)
21	DIN	I	Digital audio input (Optical input)
22	DOUT	O	Digital audio output (Optical output)
23	ADDT	I	Data input from the A/D converter
24	DADT	O	Data output to the D/A converter
25	LRCK	O	LR clock output for the A/D and D/A converter (44.1 kHz)
26	XBCK	O	Bit clock output to the A/D and D/A converter (2.8224 MHz)
27	FS256	O	11.2896 MHz clock output (Not used)
28	DVDD	—	+3V power supply (Digital)
29 to 32	A03 to A00	O	DRAM address output
33	A10	O	
34 to 38	A04 to A08	O	
39	A11	O	
40	DVSS	—	Ground (Digital)
41	XOE	O	Output enable output for DRAM
42	XCAS	O	$\overline{\text{CAS}}$ signal output for DRAM
43	A09	O	Address output for DRAM
44	XRAS	O	$\overline{\text{RAS}}$ signal output for DRAM
45	XWE	O	Write enable signal output for DRAM

* I (S) stands for Schmidt input, I (A) for analog input, O (3) for 3-state output, and O (A) for analog output in the column I/O

Pin No.	Pin Name	I/O	Function
46	D1	I/O	Data input/output for DRAM
47	D0	I/O	
48, 49	D2, D3	I/O	
50	MVCI	I (S)	Clock input from an external VCO (Fixed at “L”)
51	ASYO	O	Playback EFM duplex signal output
52	ASYI	I (A)	Playback EFM comparator slice level input
53	AVDD	—	+3V power supply (Analog)
54	BIAS	I (A)	Playback EFM comparator bias current input
55	RFI	I (A)	Playback EFM RF signal input
56	AVSS	—	Ground (Analog)
57	PDO	O (3)	Phase comparison output for the clock playback analog PLL of the playback EFM (Not used)
58	PCO	O (3)	Phase comparison output for the recording/playback EFM master PLL
59	FILI	I (A)	Filter input for the recording/playback EFM master PLL
60	FILO	O (A)	Filter output for the recording/playback EFM master PLL
61	CLTV	I (A)	Internal VCO control voltage input for the recording/playback EFM master PLL
62	PEAK	I (A)	Light amount signal peak hold input from the CXA2523R
63	BOTM	I (A)	Light amount signal bottom hold input from the CXA2523R
64	ABCD	I (A)	Light amount signal input from the CXA2523R
65	FE	I (A)	Focus error signal input from the CXA2523R
66	AUX1	I (A)	Auxiliary A/D input
67	VC	I (A)	Middle point voltage (+1.5V) input from the CXA2523R
68	ADIO	O (A)	Monitor output of the A/D converter input signal (Not used)
69	AVDD	—	+3V power supply (Analog)
70	ADRT	I (A)	A/D converter operational range upper limit voltage input (Fixed at “H”)
71	ADRB	I (A)	A/D converter operational range lower limit voltage input (Fixed at “L”)
72	AVSS	—	Ground (Analog)
73	SE	I (A)	Sled error signal input from the CXA2523R
74	TE	I (A)	Tracking error signal input from the CXA2523R
75	AUX2	I (A)	Auxiliary A/D input (Fixed at “L”)
76	DCHG	I (A)	Connected to +3V power supply
77	APC	I (A)	Error signal input for the laser digital APC (Fixed at “L”)
78	ADFG	I (S)	ADIP duplex FM signal input from the CXA2523R (22.05 ± 1 kHz)
79	F0CNT	O	Filter f_0 control output to the CXA2523R
80	XLRF	O	Control latch output to the CXA2523R
81	CKRF	O	Control clock output to the CXA2523R
82	DTRF	O	Control data output to the CXA2523R
83	APCREF	O	Reference PWM output for the laser APC
84	LDDR	O	PWM output for the laser digital APC (Not used)
85	TRDR	O	Tracking servo drive PWM output (–)

• Abbreviation
EFM: Eight to Fourteen Modulation
PLL : Phase Locked Loop
VCO: Voltage Controlled Oscillator

Pin No.	Pin Name	I/O	Function
86	TFDR	O	Tracking servo drive PWM output (+)
87	DVDD	—	+3V power supply (Digital)
88	FFDR	O	Focus servo drive PWM output (+)
89	FRDR	O	Focus servo drive PWM output (–)
90	FS4	O	176.4 kHz clock signal output (X'tal) (Not used)
91	SRDR	O	Sled servo drive PWM output (–)
92	SFDR	O	Sled servo drive PWM output (+)
93	SPRD	O	Spindle servo drive PWM output (–)
94	SPFD	O	Spindle servo drive PWM output (+)
95	TEST0	I (S)	Test input (Fixed at "L")
96 to 98	TEST1 to TEST3	I	
99	DVSS	—	Ground (Digital)
100	EFMO	O	EFM output when recording

• Abbreviation
EFM: Eight to Fourteen Modulation

• IC201 A/D, D/A converter (CXD8607N) (MAIN Board)

Pin No.	Pin Name	I/O	Function
1	INRP	I	Rch analog (+) input
2	INRM	I	Rch analog (–) input
3	REFI	I	A/D reference voltage input (+3.2V)
4	AVDD	—	+5V power supply (A/D, analog)
5	AVss	—	Ground (A/D, analog)
6	APD	I	A/D analog block power down "L": Power down
7	NU	—	Not used
8	NU	—	
9	TEST1	I	Test pin (Fixed at "L")
10	LRCK1	I	A/D LRCK input
11	BCK1	I	A/D BCK input
12	ADDT	O	A/D data output
13	V35A	—	+3.3V power supply
14	VSS1 (LF)	—	Ground (A/D, digital)
15	MCKI	I	A/D master clock input (256 fs)
16	DPD	I	A/D digital block power down "L": Power down/reset
17	VSS2 (LF)	—	Ground (D/A, digital)
18	INIT	I	D/A initialize "L": Initialize
19	MODE	I	Mode flag input
20	SHIFT	I	Shift clock input
21	LATCH	I	Latch clock input
22	256CK	O	256 fs clock output
23	V35D	—	+3.3V power supply
24	VSS2	—	Ground (D/A, digital)
25	512CK	O	512 fs clock output
26	BCK2	I	D/A BCK input
27	DADT	I	D/A data input
28	LRCK2	I	D/A LRCK input
29	VDD2	—	+5V power supply (D/A, digital)
30	R1	O	Rch PLM output 1
31	AVDDR	—	+5V power supply (D/A, Rch, analog)
32	R2	O	Rch PLM output 2
33	AVSSR	—	Ground (D/A, Rch, analog)
34	XVDD	—	+5V power supply (X'tal)
35	XOUT	O	X'tal oscillation output (22 MHz)
36	XIN	I	X'tal oscillation input (512 fs) (22 MHz)
37	XVSS	—	Ground (X'tal)
38	AVSSL	—	Ground (D/A, Lch, analog)
39	L2	O	Lch PLM output 2
40	AVDDL	—	+5V power supply (D/A, Lch, analog)

Pin No.	Pin Name	I/O	Function
41	L1	O	Lch PLM output 1
42	V_{DD2}	—	+5V power supply (D/A, digital)
43	V_{DD1}	—	+5V power supply (A/D, digital)
44	V_{DD1}	—	
45	V_{SS1}	—	Ground (A/D, digital)
46	TEST2	I	Test pin (Fixed at “L”)
47	TEST3	I	
48	V_{SS1} (LF)	—	Ground (A/D, digital)
49	NU	—	Not used
50	NU	—	
51	AV_{SS} (LF)	—	Ground (A/D, analog)
52	LV_{DD}	—	+5V power supply (A/D, buffer)
53	LV_{SS}	—	Ground (A/D, buffer)
54	REFO	O	A/D reference voltage output (+3.2V)
55	INLM	I	Lch analog (–) input
56	INLP	I	Lch analog (+) input

• IC401 System Control (M30610MCA-261FP) (MAIN Board)

Pin No.	Pin Name	I/O	Function
1, 2	NC	O	Not used
3	(DAOUT0)	O	
4	(DAOUT1)	O	
5	SQSY	I	ADIP sync or subcode Q sync input from CXD2652AR
6	REMOCON	I	Remote controls
7	CONTROL A1 IN	I	Signal input from CONTROL A1
8	BYTE	I	Not used
9	CNVSS	—	Ground
10	XIN-T	O	Not used
11	XOUT-T	O	
12	SYSTEM RST	I	System reset input “L”: reset
13	XOUT	O	Main clock output (7.0MHz)
14	GND	—	Ground
15	XIN	I	Main clock input (7.0MHz)
16	VCC (3.3V)	—	+3.3V power supply
17	NMI	I	(Fixed at “H”)
18	DQSY	I	Subcode Q sync input of digital in U-bit. CD format from CXD2652AR
19	P.DOWN	I	Power down detection input “L”: Power down
20	XINT	I	Interrupt status input from CXD2652AR
21, 22	JOG1, JOG0	I	JOG dial pulse input from the rotary encoder
23 to 25	NC	O	Not used
26	NC (BEEP)	O	
27 to 30	NC	O	
31	SWDT	O	Writing data signal output to the serial bus
32	SRDT	I	Reading data signal input from the serial bus
33	SCLK	O	Clock signal output to the serial bus
34	FLCS	O	Chip select signal output to the display driver
35	FLDATA	O	Serial data signal output to the display driver
36	NC	O	Not used (Fixed at “L”)
37	FLCLK	O	Serial clock signal output to the display driver
38 to 47	NC	O	Not used
48	ADA RES	O	Reset signal output to the D/A, A/D converter Reset: “L”
49	AMUTE	O	Line out muting output Mute: “L”
50	STBY	O	Strobe signal output to the power supply circuit Power supply ON: “H”, stand by: “L”
51	CHACK IN	I	Detection input from the chucking-in switch “L”: Chucking
52	PACK-IN	I	Detection input from the disc detection switch (Fixed at “L”)
53	PACK-OUT	I	Detection input from the loading out switch. Loaded out position: “L”, Others: “H”
54	LDIN	I	Loading motor control input
55	LDOUT	O	Loading motor control output
56	LD-LOW	O	Loading motor voltage control output Low voltage: “H”
57, 58	NC	O	Not used
59	REC-P	I	Detection signal input from the recording position detection switch
60	PB-P	I	Detection signal input from the playback position detection switch
61	REC/PB (NC)	O	Not used
62	+3V	—	+3.3V power supply

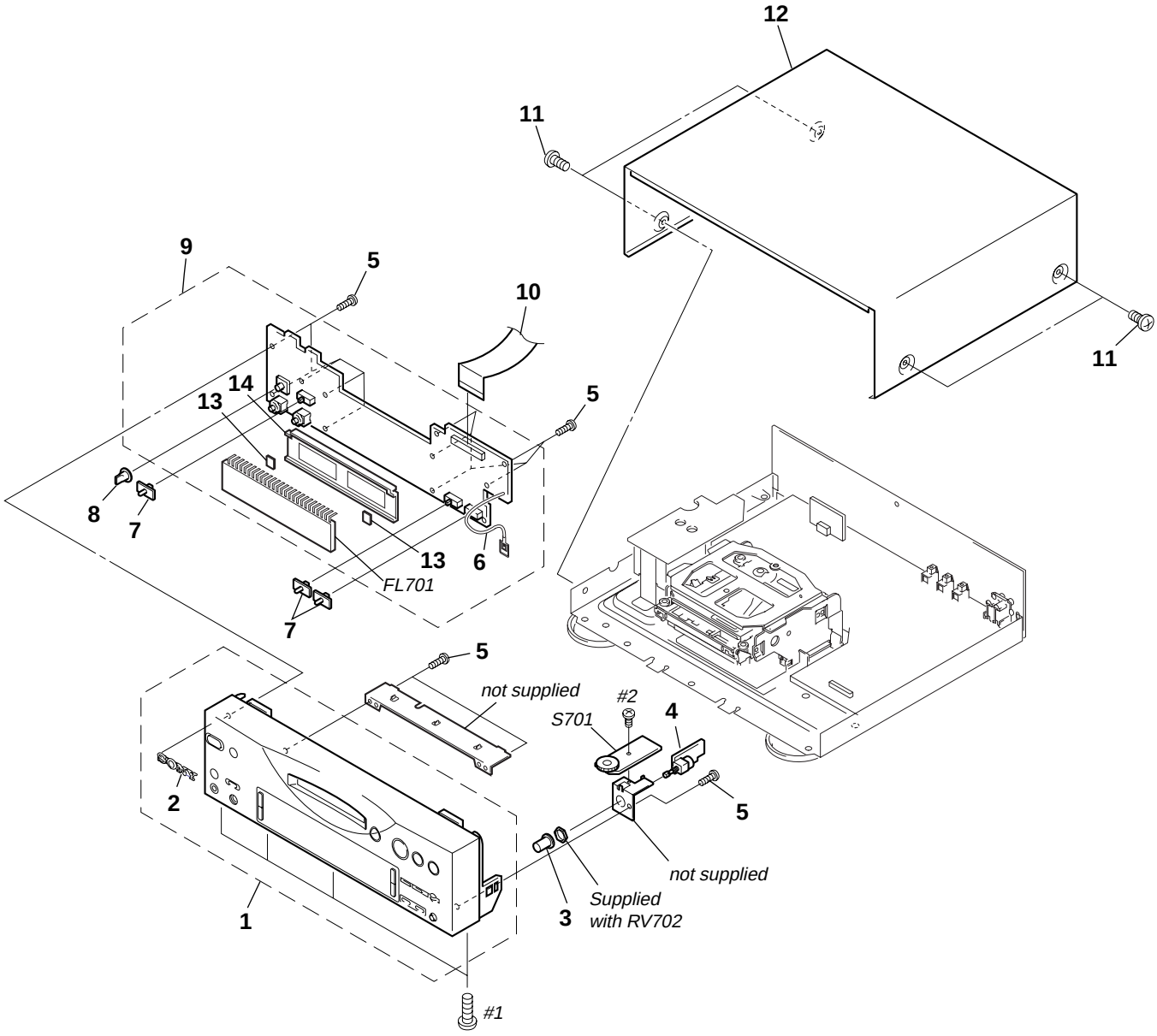
Pin No.	Pin Name	I/O	Function
63	NC	O	Not used
64	GND	—	Ground
65	SENS	I	Internal status (SENSE) input from the CXD2652AR
66	NMT1 (SHOCK)	I	Track jump signal input from the CXD2652AR
67	DIG-RST	O	Digital rest signal output to the CXD2652AR and motor driver Reset: “L”
68	MNT2 (XBUSY)	I	In the state of executive command from the CXD2652AR
69	LDON	O	Laser ON/OFF control output “H”: Laser ON
70	REFLECT	I	Disk reflection rate detection input from the reflect detection switch Disk with low reflection rate: “H”
71	XLATCH	O	Latch signal output to the serial bus
72	PROTECT	I	Recording-protection claw detection input from the protection detection switch Protect: “H”
73	MOD	O	Laser modulation switching signal output
74	LIMIT-IN	I	Detection input from the limit switch Sled limit-In: “L”
75	WR PWR	O	Write power ON/OFF output
76	MNT3 (SLOCK)	I	In the state of spindle srvo lock from the CXD2562AR
77	MNT0 (FOK)	I	Focus OK signal input from the CXD2652AR “H” is input when focus is on
78	SDA	I/O	Data signal input/output pin with the backup memory
79	SCL	O	Clock signal output to the backup memory
80	SCTX	O	Writing data transmission timing output to the CXD2652AR Shared with the magnetic head ON/OFF output
81	CLOCKSET0	I	Clock destination select pin US, Canadian: “L”, Except US, Canadian : “H”
82	CLOCKSET1	I	Clock destination select pin US, Canadian: “H”, Except US, Canadian : “L”
83	LED0 (POWER)	O	LED control signal output for POWER ON/STANDBY indicator
84	LED1 (NC)	O	Not used
85	NC	O	
86	OPT SEL	O	Digital input select signal output
87	CONTROL A1 OUT	O	Control signal output to CONTROL A1 OUT terminal
88	NC (BEEP SW)	O	Not used
89	SOURCE SW	I	Input source change input (A/D input)
90	NC	O	Not used
91	TIMER SW	I	Timer mode change input (A/D input)
92	NC	O	Not used
93	NC (KEY3)	O	
94,95	KEY 2, KEY 1	I	Key input pin (A/D input)
96	AVSS	—	Ground (Analog)
97	KEY0	I	Key input pin (A/D input)
98	VREF	—	A/D reference voltage (Fixed at “H”)
99	AVCC	—	+3.3V power supply
100	MONO/ST	I	Monaural, stereo change input Monaural: “H”

SECTION 7
EXPLODED VIEWS

NOTE:
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  SP : Singapore model

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

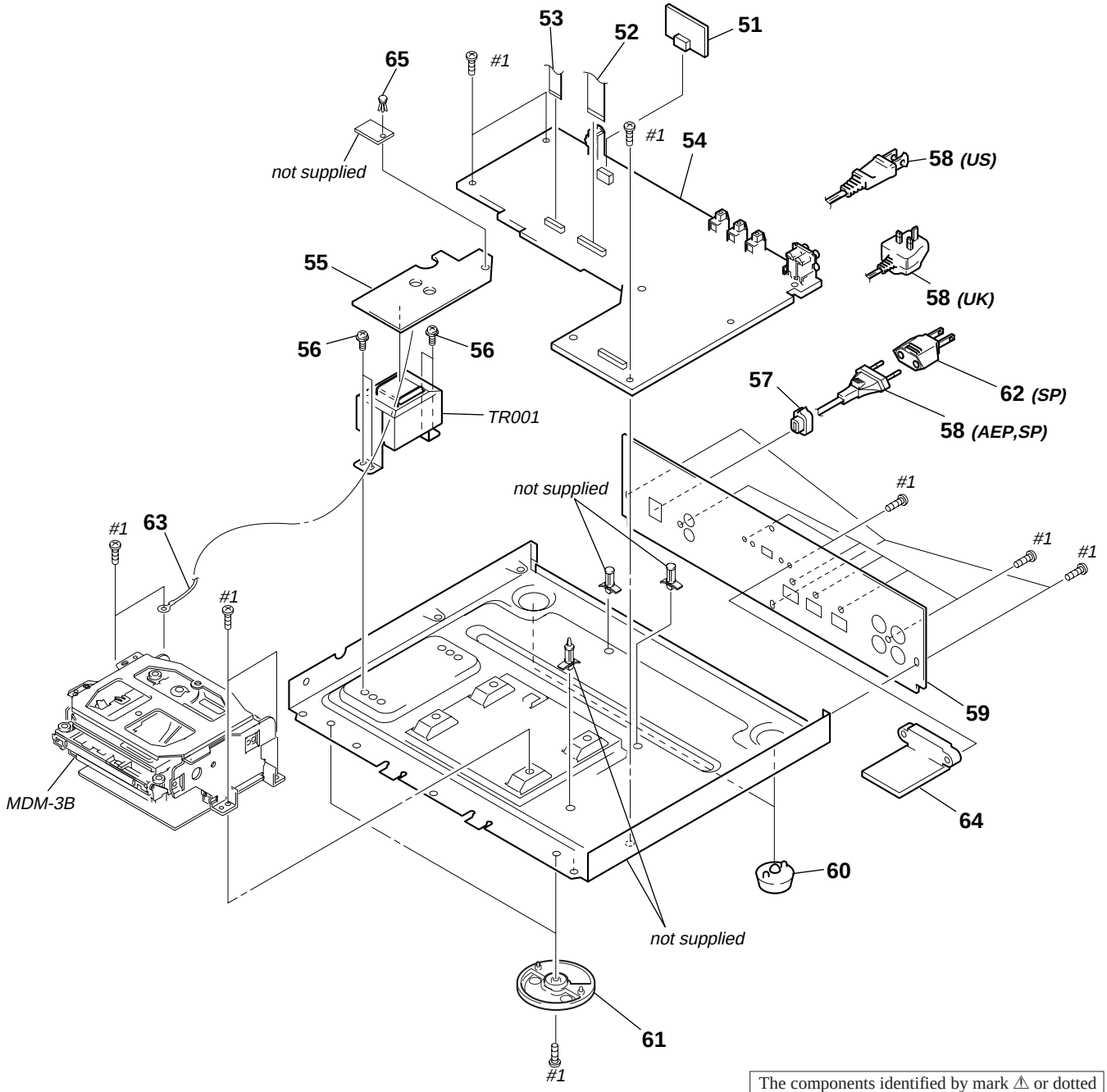
7-1. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
1	X-4950-175-1	PANEL ASSY, FRONT	
2	4-962-708-01	EMBLEM (4-A), SONY	
3	4-996-311-01	KNOB (REC)	
* 4	1-668-216-11	VOLUME BOARD	
5	4-951-620-01	SCREW (2.6X8), +BVTP	
* 6	1-690-880-31	LEAD (WITH CONNECTOR)	
7	4-996-312-01	KNOB (TIMER)	
8	4-998-455-01	KNOB (HP)	
* 9	A-4724-251-A	PANEL BOARD, COMPLETE (SP)	
* 9	A-4724-288-A	PANEL BOARD, COMPLETE (AEP,UK)	

Ref. No.	Part No.	Description	Remark
* 9	A-4724-509-A	PANEL BOARD, COMPLETE (US)	
10	1-782-265-11	WIRE (FLAT TYPE) (23 CORE)	
11	3-363-099-11	SCREW (CASE 3 TP2)	
* 12	4-985-899-91	CASE	
13	2-389-320-01	CUSHION	
* 14	4-983-462-01	HOLDER (FL)	
FL701	1-517-353-11	INDICATOR TUBE, FLUORESCENT	
S701	1-475-657-11	ENCODER, ROTARY	

7-2. CHASSIS SECTION

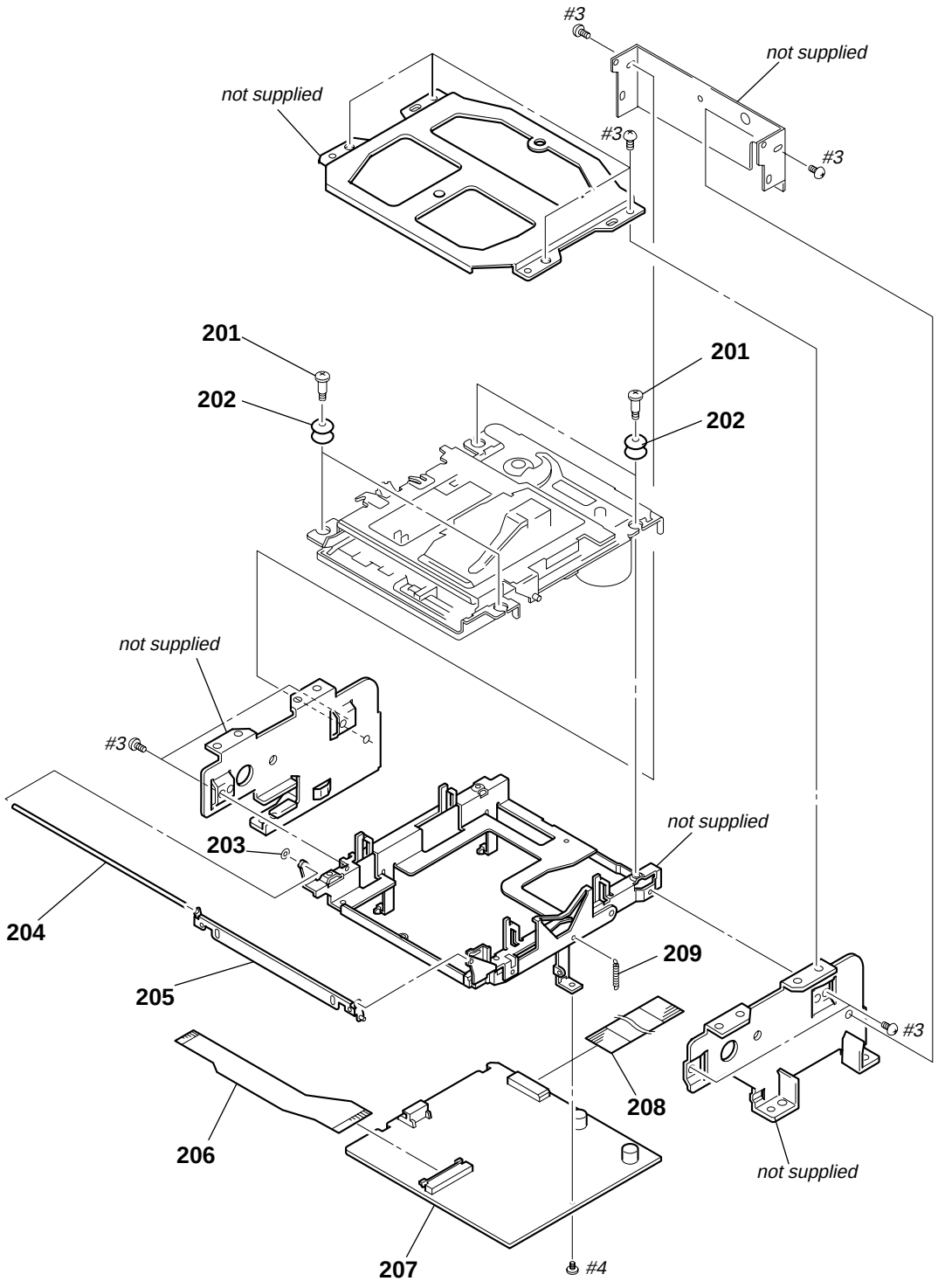


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
* 51	1-668-214-11	BACK UP BOARD	
52	1-782-263-11	WIRE (FLAT TYPE) (29 CORE)	
53	1-782-264-11	WIRE (FLAT TYPE) (19 CORE)	
* 54	A-4724-250-A	MAIN BOARD, COMPLETE (SP)	
* 54	A-4724-287-A	MAIN BOARD, COMPLETE (AEP,UK)	
* 54	A-4724-508-A	MAIN BOARD, COMPLETE (US)	
* 55	1-668-217-11	TRANS BOARD	
56	4-886-821-11	SCREW, S TIGHT, +PTTWH 3X6	
57	3-703-244-00	BUSHING (2104), CORD (AEP,UK,SP)	
* 57	3-703-571-11	BUSHING (S) (4516), CORD (US)	
⚠58	1-558-945-21	CORD, POWER (POLAR, SPT-1) (US)	
⚠58	1-696-586-21	CORD, POWER (UK)	
⚠58	1-751-275-11	CORD, POWER (AEP,SP)	

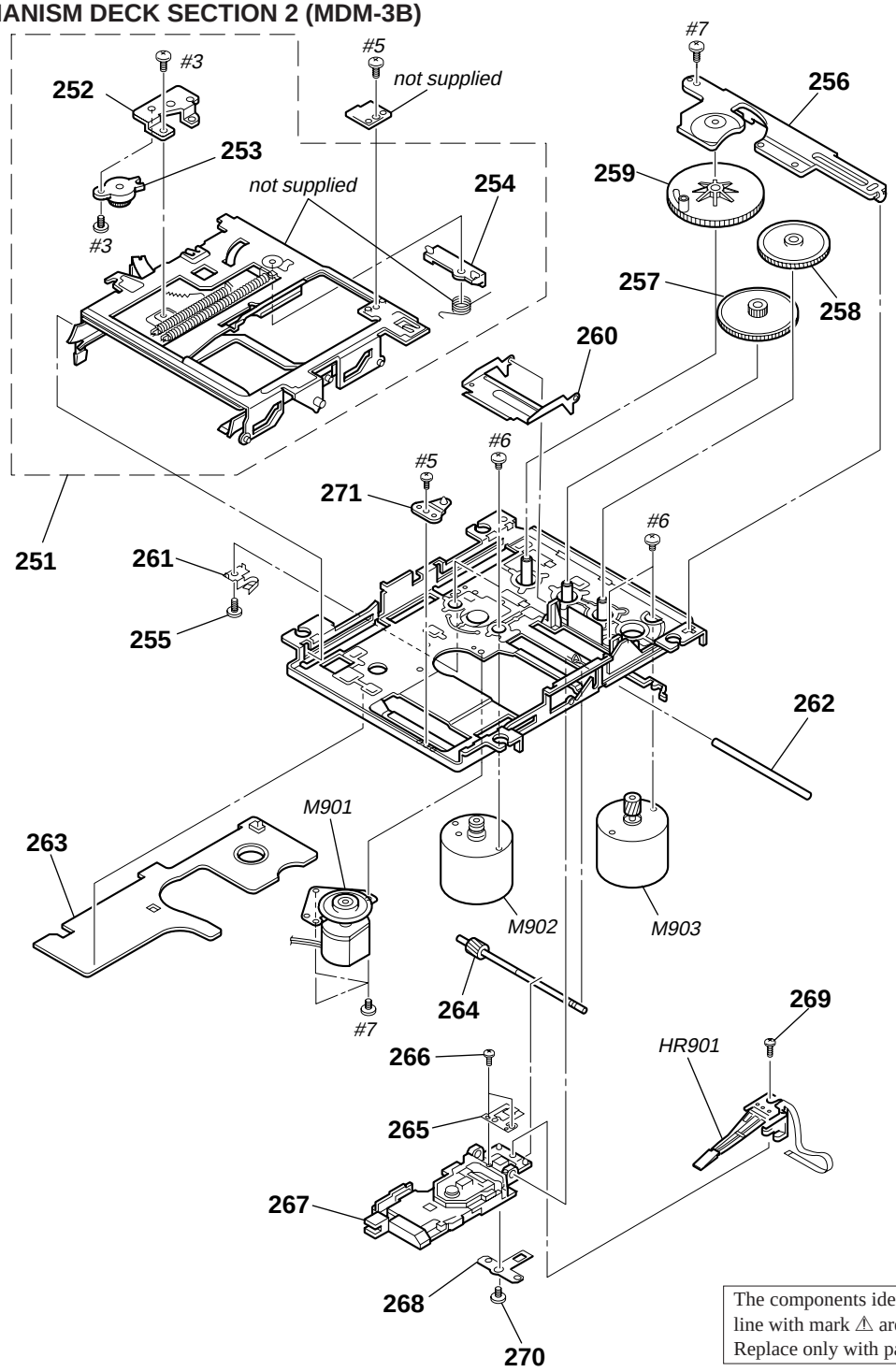
Ref. No.	Part No.	Description	Remark
* 59	4-996-315-12	PANEL, BACK (SP)	
* 59	4-996-315-21	PANEL, BACK (AEP,UK)	
* 59	4-996-315-31	PANEL, BACK (US)	
60	4-965-822-01	FOOT	
61	4-977-699-11	LEG (F)	
⚠62	1-569-008-21	ADAPTOR, CONVERSION 2P (SP)	
63	1-775-377-21	LEAD (WITH CONNECTOR) (US,AEP,UK)	
* 64	1-670-450-11	VOLTAGE SELECTOR BOARD (AEP,UK,SP)	
65	3-531-576-11	RIVET	
⚠TR001	1-431-252-21	TRANSFORMER, POWER (US)	
⚠TR001	1-431-253-21	TRANSFORMER, POWER (AEP,UK)	
⚠TR001	1-431-254-11	TRANSFORMER, POWER (SP)	

7-3. MECHANISM DECK SECTION 1 (MDM-3B)



Ref. No.	Part No.	Description	Remark
201	4-628-167-01	SCREW, STEP	
202	4-987-327-01	INSULATOR	
203	4-986-959-01	WASHER, STOPPER	
204	4-987-736-01	SHAFT (SHUTTER)	
205	X-4947-825-1	SHUTTER ASSY	
206	1-660-966-11	PC BOARD, OP RALAY FLEXIBLE	
* 207	A-4699-770-A	BD BOARD, COMPLETE	
208	1-777-517-11	WIRE (FLAT TYPE) (15 CORE)	
209	4-997-962-01	SPRING (O/C), TENSION	

7-4. MECHANISM DECK SECTION 2 (MDM-3B)



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
251	A-4672-138-A	SLIDER, COMPLETE ASSY	
* 252	4-983-439-01	BRACKET (DAMPER)	
253	3-953-235-01	DAMPER, OIL	
* 254	4-983-437-01	SLIDER (CAM)	
255	3-342-375-11	SCREW (M1.7X1.4), SPECIAL	
256	4-979-890-11	RETAINER (GEAR)	
257	4-979-898-01	GEAR (LB)	
258	4-979-899-01	GEAR (LC)	
259	4-979-897-01	GEAR (LA)	
260	4-979-885-01	LEVER (HEAD UP)	
261	4-979-906-11	SPRING (LEAD SCREW)	
262	4-984-556-01	SHAFT (MAIN SHAFT)	
* 263	1-661-774-11	SW BOARD	

Ref. No.	Part No.	Description	Remark
264	A-3304-200-A	SCREW ASSY, LEAD	
265	4-963-914-02	RACK (INSERTER)	
266	3-366-890-11	SCREW (M1.4)	
⚠ 267	8-583-028-02	OPTICAL PICK-UP KMS-260A/J1N	
268	4-987-061-01	SPACER (RACK)	
269	4-988-560-01	SCREW (+P 1.7X6)	
270	4-955-841-11	SCREW	
* 271	4-983-511-02	PIN (OUTSERT)	
HR901	1-500-396-11	HEAD, OVER WRITE	
M901	A-4672-135-A	MOTOR ASSY, SPINDLE	
M902	A-4672-133-A	MOTOR ASSY, SLED	
M903	A-4672-134-A	MOTOR ASSY, LOADING	

BACK UP **BD**

SECTION 8
ELECTRICAL PARTS LIST

Note:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: µ , for example:
  uA...: µ A..., uPA...: µ PA..., uPB...: µ PB..., uPC...: µ PC..., uPD...: µ PD...
- CAPACITORS
  uF : µ F
- COILS
  uH : µ H
- Abbreviation
  SP : Singapore model

Ref. No.	Part No.	Description			Remark
*	1-668-214-11	BACK UP BOARD			
		**********			
		< BATTERY >			
BA501	1-528-739-11	BATTERY, LITHIUM (VL2020 3V)			
		< CONNECTOR >			
* CN502	1-569-499-11	PIN, CONNECTOR 3P			
**********					
*	A-4699-770-A	BD BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C102	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C103	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C104	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C105	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C106	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C107	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C108	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C109	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C110	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C111	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C112	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C113	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C115	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C116	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C117	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C119	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C121	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C122	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C123	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C124	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C127	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C128	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C129	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C130	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C131	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V
C132	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C133	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C134	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C135	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C136	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C141	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C142	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C143	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C144	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C146	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C151	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C152	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C153	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C156	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C158	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C160	1-104-601-11	ELECT CHIP	10uF	20%	10V
C161	1-104-601-11	ELECT CHIP	10uF	20%	10V
C163	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C164	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C167	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C168	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C169	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C171	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C181	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C182	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C183	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C184	1-107-836-11	ELECT CHIP	22uF	20%	8V
C185	1-164-611-11	CERAMIC CHIP	0.001uF	10%	500V
C187	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C188	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C189	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C190	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C191	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C195	1-164-346-11	CERAMIC CHIP	1uF		16V
C196	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C197	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN101	1-766-508-11	CONNECTOR, FFC/FPC (ZIF) 22P			
CN102	1-778-461-11	CONNECTOR, FFC/FPC 29P			
CN103	1-778-460-11	CONNECTOR, FFC/FPC 19P			
CN104	1-766-898-21	HOUSING, CONNECTOR (PC BOARD) 4P			
CN106	1-770-698-11	CONNECTOR, FFC/FPC 15P			
CN110	1-774-731-21	PIN, CONNECTOR (PC BOARD) 5P			
		< DIODE >			
D101	8-719-988-62	DIODE 1SS355			
D181	8-719-046-86	DIODE F1J6TP			
D183	8-719-046-86	DIODE F1J6TP			
		< IC >			
IC101	8-752-080-95	IC CXA2523AR			

Ref. No.	Part No.	Description			Remark
IC103	8-729-903-10	IC TRANSISTOR FMW1			
IC121	8-752-384-47	IC CXD2652AR			
IC122	8-759-234-20	IC TC7S08F			
IC123	8-759-242-70	IC TC7WU04F			
IC124	8-759-473-29	IC MN41V4400SJ-08-T1			
IC152	8-759-430-25	IC BH6511FS-E2			
IC171	8-759-484-73	IC BR24C01AF-E2			
IC181	8-759-095-65	IC TC74ACT540FS			
IC192	8-759-426-95	IC L88MS33T-TL			
		< COIL >			
L101	1-414-235-11	INDUCTOR CHIP 0uH			
L102	1-414-235-11	INDUCTOR CHIP 0uH			
L103	1-414-235-11	INDUCTOR CHIP 0uH			
L105	1-414-235-11	INDUCTOR CHIP 0uH			
L106	1-414-235-11	INDUCTOR CHIP 0uH			
L121	1-414-235-11	INDUCTOR CHIP 0uH			
L122	1-414-235-11	INDUCTOR CHIP 0uH			
L151	1-412-622-51	INDUCTOR 10uH			
L152	1-412-622-51	INDUCTOR 10uH			
L153	1-412-039-51	INDUCTOR CHIP 100uH			
L154	1-412-039-51	INDUCTOR CHIP 100uH			
L161	1-414-235-11	INDUCTOR CHIP 0uH			
L162	1-414-235-11	INDUCTOR CHIP 0uH			
		< TRANSISTOR >			
Q101	8-729-028-91	TRANSISTOR DTA144EUA-T106			
Q102	8-729-026-53	TRANSISTOR 2SA1576A-T106-QR			
Q103	8-729-402-93	TRANSISTOR UN5214-TX			
Q104	8-729-402-93	TRANSISTOR UN5214-TX			
Q162	8-729-101-07	TRANSISTOR 2SB798-DL			
Q163	8-729-028-91	TRANSISTOR DTA144EUA-T106			
Q180	8-729-015-76	TRANSISTOR UN5211			
Q181	8-729-018-75	TRANSISTOR 2SJ278MY			
Q182	8-729-017-65	TRANSISTOR 2SK1764KY			
		< RESISTOR >			
R101	1-216-295-91	SHORT	0		
R103	1-216-049-91	RES,CHIP	1K	5%	1/10W
R104	1-216-073-00	METAL CHIP	10K	5%	1/10W
R105	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R106	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R107	1-216-113-00	METAL CHIP	470K	5%	1/10W
R109	1-216-295-91	SHORT	0		
R110	1-216-073-00	METAL CHIP	10K	5%	1/10W
R111	1-216-295-91	SHORT	0		
R112	1-216-089-91	RES,CHIP	47K	5%	1/10W
R113	1-216-049-91	RES,CHIP	1K	5%	1/10W
R115	1-216-049-91	RES,CHIP	1K	5%	1/10W
R117	1-216-113-00	METAL CHIP	470K	5%	1/10W
R120	1-216-025-91	RES,CHIP	100	5%	1/10W
R121	1-216-097-91	RES,CHIP	100K	5%	1/10W
R123	1-216-033-00	METAL CHIP	220	5%	1/10W
R124	1-216-025-91	RES,CHIP	100	5%	1/10W
R125	1-216-025-91	RES,CHIP	100	5%	1/10W
R127	1-216-025-91	RES,CHIP	100	5%	1/10W
R131	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R132	1-216-097-91	RES,CHIP	100K	5%	1/10W
R133	1-216-117-00	METAL CHIP	680K	5%	1/10W
R134	1-216-049-91	RES,CHIP	1K	5%	1/10W
R135	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R136	1-216-049-91	RES,CHIP	1K	5%	1/10W
R137	1-216-025-91	RES,CHIP	100	5%	1/10W
R140	1-216-029-00	METAL CHIP	150	5%	1/10W
R141	1-216-295-91	SHORT	0		
R142	1-216-073-00	METAL CHIP	10K	5%	1/10W
R143	1-216-073-00	METAL CHIP	10K	5%	1/10W
R144	1-216-025-91	RES,CHIP	100	5%	1/10W
R146	1-216-037-00	METAL CHIP	330	5%	1/10W
R147	1-216-025-91	RES,CHIP	100	5%	1/10W
R148	1-216-045-00	METAL CHIP	680	5%	1/10W
R150	1-216-295-91	SHORT	0		
R158	1-216-097-91	RES,CHIP	100K	5%	1/10W
R159	1-216-097-91	RES,CHIP	100K	5%	1/10W
R161	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R162	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R163	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R164	1-216-045-00	METAL CHIP	680	5%	1/10W
R165	1-216-097-91	RES,CHIP	100K	5%	1/10W
R166	1-220-149-11	REGISTER	2.2	10%	1/2W
R167	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R169	1-219-724-11	METAL CHIP	1	1%	1/4W
R170	1-216-073-00	METAL CHIP	10K	5%	1/10W
R171	1-216-073-00	METAL CHIP	10K	5%	1/10W
R172	1-216-295-91	SHORT	0		
R173	1-216-121-91	RES,CHIP	1M	5%	1/10W
R175	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R176	1-216-295-91	SHORT	0		
R177	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R178	1-216-295-91	SHORT	0		
R179	1-216-089-91	RES,CHIP	47K	5%	1/10W
R180	1-216-073-00	METAL CHIP	10K	5%	1/10W
R181	1-216-073-00	METAL CHIP	10K	5%	1/10W
R182	1-216-089-91	RES,CHIP	47K	5%	1/10W
R183	1-216-089-91	RES,CHIP	47K	5%	1/10W
R184	1-216-073-00	METAL CHIP	10K	5%	1/10W
R185	1-216-073-00	METAL CHIP	10K	5%	1/10W
R186	1-216-296-91	SHORT	0		
R187	1-216-296-91	SHORT	0		
R188	1-216-073-00	METAL CHIP	10K	5%	1/10W
R189	1-216-073-00	METAL CHIP	10K	5%	1/10W
R190	1-216-073-00	METAL CHIP	10K	5%	1/10W
R195	1-216-295-91	SHORT	0		
R196	1-216-295-91	SHORT	0		
R198	1-216-295-91	SHORT	0		
R199	1-216-295-91	SHORT	0		
R200	1-216-295-91	SHORT	0		
R201	1-216-295-91	SHORT	0		
R202	1-216-295-91	SHORT	0		
R502	1-216-295-91	SHORT	0		
R504	1-216-295-91	SHORT	0		

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MAIN

Ref. No.	Part No.	Description			Remark
*	A-4724-287-A	MAIN BOARD, COMPLETE (AEP,UK)			
		**********			
*	A-4724-508-A	MAIN BOARD, COMPLETE (US)			
		**********			
*	A-4724-250-A	MAIN BOARD, COMPLETE (SP)			
		**********			
	7-685-872-09	SCREW +BVTT 3X8 (S)			
		< CAPACITOR >			
C001	1-117-850-11	ELECT	15000uF	20%	16V
C002	1-126-935-11	ELECT	470uF	20%	16V
C006	1-126-935-11	ELECT	470uF	20%	16V
C013	1-164-159-11	CERAMIC	0.1uF		50V
C014	1-164-159-11	CERAMIC	0.1uF		50V
C101	1-128-551-11	ELECT	22uF	20%	25V
C103	1-128-551-11	ELECT	22uF	20%	25V
C106	1-162-306-11	CERAMIC	0.01uF	20%	16V
C107	1-162-282-31	CERAMIC	100PF	10%	50V
C108	1-162-282-31	CERAMIC	100PF	10%	50V
C109	1-104-665-11	ELECT	100uF	20%	10V
C110	1-162-294-31	CERAMIC	0.001uF	10%	50V
C111	1-162-600-11	CERAMIC	0.0047uF	20%	16V
C113	1-162-600-11	CERAMIC	0.0047uF	20%	16V
C114	1-162-294-31	CERAMIC	0.001uF	10%	50V
C115	1-104-665-11	ELECT	100uF	20%	10V
C116	1-162-282-31	CERAMIC	100PF	10%	50V
C117	1-162-282-31	CERAMIC	100PF	10%	50V
C118	1-162-306-11	CERAMIC	0.01uF	20%	16V
C121	1-126-964-11	ELECT	10uF	20%	50V
C125	1-126-964-11	ELECT	10uF	20%	50V
C128	1-104-665-11	ELECT	100uF	20%	10V
C129	1-126-964-11	ELECT	10uF	20%	50V
C130	1-126-964-11	ELECT	10uF	20%	50V
C134	1-126-964-11	ELECT	10uF	20%	50V
C135	1-126-964-11	ELECT	10uF	20%	50V
C141	1-162-286-31	CERAMIC	220PF	10%	50V
C142	1-162-286-31	CERAMIC	220PF	10%	50V
C151	1-162-290-31	CERAMIC	470PF	10%	50V
C152	1-162-290-31	CERAMIC	470PF	10%	50V
C161	1-162-290-31	CERAMIC	470PF	10%	50V
C162	1-162-290-31	CERAMIC	470PF	10%	50V
C200	1-126-926-11	ELECT	1000uF	20%	10V
C201	1-162-600-11	CERAMIC	0.0047uF	20%	16V
C202	1-162-600-11	CERAMIC	0.0047uF	20%	16V
C203	1-162-306-11	CERAMIC	0.01uF	20%	16V
C205	1-162-306-11	CERAMIC	0.01uF	20%	16V
C206	1-164-159-11	CERAMIC	0.1uF		50V
C221	1-162-282-31	CERAMIC	100PF	10%	50V
C223	1-164-159-11	CERAMIC	0.1uF		50V
C231	1-162-306-11	CERAMIC	0.01uF	20%	16V
C234	1-104-665-11	ELECT	100uF	20%	10V
C235	1-162-205-31	CERAMIC	18PF	5%	50V
C236	1-162-207-31	CERAMIC	22PF	5%	50V
C243	1-162-306-11	CERAMIC	0.01uF	20%	16V
C254	1-126-934-11	ELECT	220uF	20%	10V

Ref. No.	Part No.	Description			Remark
C255	1-162-600-11	CERAMIC	0.0047uF	20%	16V
C256	1-162-600-11	CERAMIC	0.0047uF	20%	16V
C311	1-162-306-11	CERAMIC	0.01uF	20%	16V
C312	1-162-306-11	CERAMIC	0.01uF	20%	16V
C332	1-128-576-11	ELECT	100uF	20%	63V
C333	1-126-950-11	ELECT	330uF	20%	35V
C334	1-164-159-11	CERAMIC	0.1uF		50V
C340	1-164-159-11	CERAMIC	0.1uF		50V
C343	1-164-159-11	CERAMIC	0.1uF		50V
C344	1-162-306-11	CERAMIC	0.01uF	20%	16V
C345	1-164-159-11	CERAMIC	0.1uF		50V
C347	1-162-306-11	CERAMIC	0.01uF	20%	16V
C348	1-162-306-11	CERAMIC	0.01uF	20%	16V
C350	1-104-665-11	ELECT	100uF	20%	10V
C351	1-126-933-11	ELECT	100uF	20%	16V
C355	1-126-963-11	ELECT	4.7uF	20%	50V
C391	1-162-306-11	CERAMIC	0.01uF	20%	16V
C393	1-162-306-11	CERAMIC	0.01uF	20%	16V
C397	1-126-925-11	ELECT	470uF	20%	10V
C400	1-126-925-11	ELECT	470uF	20%	10V
C401	1-131-347-00	TANTALUM	1uF	10%	35V
C409	1-162-294-31	CERAMIC	0.001uF	10%	50V
C410	1-162-294-31	CERAMIC	0.001uF	10%	50V
C411	1-162-294-31	CERAMIC	0.001uF	10%	50V
C412	1-164-159-11	CERAMIC	0.1uF		50V
C413	1-164-159-11	CERAMIC	0.1uF		50V
C414	1-164-159-11	CERAMIC	0.1uF		50V
C415	1-164-159-11	CERAMIC	0.1uF		50V
C420	1-162-294-31	CERAMIC	0.001uF	10%	50V
C421	1-162-294-31	CERAMIC	0.001uF	10%	50V
C432	1-162-282-31	CERAMIC	100PF	10%	50V
C433	1-162-282-31	CERAMIC	100PF	10%	50V
C467	1-162-282-31	CERAMIC	100PF	10%	50V
C468	1-162-282-31	CERAMIC	100PF	10%	50V
C486	1-164-159-11	CERAMIC	0.1uF		50V
C490	1-162-282-31	CERAMIC	100PF	10%	50V
C501	1-126-964-11	ELECT	10uF	20%	50V
C503	1-126-916-11	ELECT	1000uF	20%	6.3V
C504	1-126-934-11	ELECT	220uF	20%	10V
C505	1-126-926-11	ELECT	1000uF	20%	10V
C508	1-126-963-11	ELECT	4.7uF	20%	50V
C509	1-126-960-11	ELECT	1uF	20%	50V
C510	1-164-159-11	CERAMIC	0.1uF		50V
C513	1-104-663-11	ELECT	33uF	20%	25V
C514	1-126-964-11	ELECT	10uF	20%	50V
C522	1-164-159-11	CERAMIC	0.1uF	20%	50V
C523	1-126-968-11	ELECT	100uF	20%	50V
C541	1-126-934-11	ELECT	220uF	20%	10V
C542	1-162-306-11	CERAMIC	0.01uF	20%	16V
C551	1-126-934-11	ELECT	220uF	20%	10V
C552	1-162-306-11	CERAMIC	0.01uF	20%	16V
C605	1-164-159-11	CERAMIC	0.1uF		50V
C606	1-164-159-11	CERAMIC	0.1uF		50V
C801	1-162-306-11	CERAMIC	0.01uF	20%	16V
C802	1-164-159-11	CERAMIC	0.1uF		50V
C803	1-164-159-11	CERAMIC	0.1uF		50V
C804	1-164-159-11	CERAMIC	0.1uF		50V

Ref. No.	Part No.	Description			Remark
C805	1-162-306-11	CERAMIC	0.01uF	20%	16V
C806	1-164-159-11	CERAMIC	0.1uF		50V
C807	1-162-306-11	CERAMIC	0.01uF	20%	16V
C808	1-162-306-11	CERAMIC	0.01uF	20%	16V
C809	1-162-282-31	CERAMIC	100PF	10%	50V
C810	1-164-159-11	CERAMIC	0.1uF		50V
C811	1-162-187-31	CERAMIC	1PF	20%	50V
C816	1-164-159-11	CERAMIC	0.1uF		50V (US)
C5013	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
CN401	1-770-167-11	CONNECTOR, FFC/FPC 19P			
CN402	1-770-657-11	CONNECTOR, FFC/FPC 29P			
* CN403	1-564-337-00	PIN, CONNECTOR 3P			
CN501	1-569-490-11	SOCKET, CONNECTOR 3P			
CN700	1-770-651-11	CONNECTOR, FFC/FPC 23P			
* CN800	1-564-708-11	PIN, CONNECTOR (SMALL TYPE) 6P			
		< DIODE >			
D001	8-719-200-82	DIODE 11ES2			
D002	8-719-200-82	DIODE 11ES2			
D003	8-719-200-82	DIODE 11ES2			
D004	8-719-200-82	DIODE 11ES2			
D005	8-719-911-19	DIODE 1SS119-25			
D006	8-719-911-19	DIODE 1SS119-25			
D007	8-719-200-82	DIODE 11ES2			
D008	8-719-200-82	DIODE 11ES2			
D009	8-719-200-82	DIODE 11ES2			
D350	8-719-933-40	DIODE HZS6C2L			
D485	8-719-933-40	DIODE HZS6C2L			
D486	8-719-911-19	DIODE 1SS119-25			
D501	8-719-911-19	DIODE 1SS119-25			
D531	8-719-118-64	DIODE RD5.6F-T7B3			
D541	8-719-210-21	DIODE 11EQS04			
D599	8-719-210-21	DIODE 11EQS04			
		< GROUND PLATE >			
EP301	1-537-771-21	TERMINAL BOARD, GROUND			
EP302	1-537-771-21	TERMINAL BOARD, GROUND			
		< IC >			
IC101	8-759-426-97	IC LA9615			
IC201	8-759-426-99	IC CXD8607N			
IC308	8-759-634-50	IC M5218AL			
IC310	8-759-633-42	IC M5293L			
IC311	8-759-822-09	IC LB1641			
IC314	8-759-917-18	IC SN74HCU04AN			
IC315	8-759-916-12	IC SN74HC00AN			
IC352	8-749-012-69	IC GP1F38T (DIGITAL OPTICAL OUT)			
IC353	8-749-012-70	IC GP1F38R (DIGITAL OPTICAL IN)			
IC401	8-759-541-84	IC M30610MCA-261FP			
IC501	8-759-426-96	IC LA5620			
IC502	8-759-481-02	IC M62016L			
IC541	8-759-708-06	IC NJM78L06A			
IC551	8-759-700-69	IC NJM79L12A			

Ref. No.	Part No.	Description				
		< JACK >				
J101	1-770-720-11	JACK, PIN 4P (LINE (ANALOG) IN, OUT))				
J401	1-779-655-21	JACK (SMALL TYPE)(2 GANG) (S LINK CONTROL A1)				
		< JUMPER RESISTOR >				
JW045	1-412-473-21	INDUCTOR	0UH			
JW087	1-412-473-21	INDUCTOR	0UH			
JW088	1-412-473-21	INDUCTOR	0UH			
JW089	1-412-473-21	INDUCTOR	0UH			
JW090	1-412-473-21	INDUCTOR	0UH			
JW091	1-249-413-11	CARBON 470 5% 1/4W F				
		< COIL >				
L225	1-410-397-21	FERRITE BEAD INDUCTOR				
L305	1-410-509-11	INDUCTOR	10uH			
L801	1-414-142-11	INDUCTOR	1uH			
L802	1-412-473-21	INDUCTOR	0uH			
L803	1-412-473-21	INDUCTOR	0uH			
L804	1-412-473-21	INDUCTOR	0uH			
L805	1-414-142-11	INDUCTOR	1uH (AEP,UK,SP)			
L805	1-412-473-21	INDUCTOR	0uH (US)			
L806	1-410-466-41	INDUCTOR	4.7uH			
L809	1-412-473-21	INDUCTOR	0uH			
L810	1-414-142-11	INDUCTOR	1uH			
L811	1-410-501-11	INDUCTOR	2.2uH			
		< TRANSISTOR >				
Q102	8-729-141-30	TRANSISTOR	2SC3623A-LK			
Q202	8-729-141-30	TRANSISTOR	2SC3623A-LK			
Q203	8-729-194-57	TRANSISTOR	2SC945-P			
Q306	8-729-422-57	TRANSISTOR	UN4111			
Q311	8-729-119-76	TRANSISTOR	2SA1175-HFE			
Q312	8-729-900-80	TRANSISTOR	DTC114ES			
Q485	8-729-620-05	TRANSISTOR	2SC2603-EF			
		< RESISTOR >				
R107	1-247-862-11	CARBON	20K	5%	1/4W	
R108	1-247-862-11	CARBON	20K	5%	1/4W	
R109	1-249-429-11	CARBON	10K	5%	1/4W	
R110	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R111	1-249-417-11	CARBON	1K	5%	1/4W	F
R113	1-249-417-11	CARBON	1K	5%	1/4W	F
R114	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R115	1-249-429-11	CARBON	10K	5%	1/4W	
R116	1-247-862-11	CARBON	20K	5%	1/4W	
R117	1-247-862-11	CARBON	20K	5%	1/4W	
R121	1-249-441-11	CARBON	100K	5%	1/4W	
R123	1-249-429-11	CARBON	10K	5%	1/4W	
R124	1-249-429-11	CARBON	10K	5%	1/4W	
R125	1-249-433-11	CARBON	22K	5%	1/4W	
R126	1-249-438-11	CARBON	56K	5%	1/4W	
R127	1-249-429-11	CARBON	10K	5%	1/4W	
R128	1-249-429-11	CARBON	10K	5%	1/4W	
R129	1-249-438-11	CARBON	56K	5%	1/4W	
R130	1-249-433-11	CARBON	22K	5%	1/4W	

MAIN PANEL

Ref. No.	Part No.	Description			Remark
R131	1-249-429-11	CARBON	10K	5%	1/4W
R132	1-249-429-11	CARBON	10K	5%	1/4W
R134	1-249-441-11	CARBON	100K	5%	1/4W
R141	1-249-427-11	CARBON	6.8K	5%	1/4W F
R142	1-249-427-11	CARBON	6.8K	5%	1/4W F
R143	1-249-429-11	CARBON	10K	5%	1/4W
R144	1-249-429-11	CARBON	10K	5%	1/4W
R145	1-249-427-11	CARBON	6.8K	5%	1/4W F
R146	1-249-427-11	CARBON	6.8K	5%	1/4W F
R147	1-249-429-11	CARBON	10K	5%	1/4W
R148	1-249-429-11	CARBON	10K	5%	1/4W
R150	1-249-429-11	CARBON	10K	5%	1/4W
R151	1-249-437-11	CARBON	47K	5%	1/4W
R152	1-249-411-11	CARBON	330	5%	1/4W
R153	1-249-441-11	CARBON	100K	5%	1/4W
R160	1-249-429-11	CARBON	10K	5%	1/4W
R161	1-249-437-11	CARBON	47K	5%	1/4W
R162	1-249-411-11	CARBON	330	5%	1/4W
R163	1-249-441-11	CARBON	100K	5%	1/4W
R198	1-249-429-11	CARBON	10K	5%	1/4W
R199	1-249-415-11	CARBON	680	5%	1/4W F
R201	1-249-401-11	CARBON	47	5%	1/4W F
R202	1-249-401-11	CARBON	47	5%	1/4W F
R203	1-249-412-11	CARBON	390	5%	1/4W F
R204	1-247-836-11	CARBON	1.6K	5%	1/4W
R206	1-249-401-11	CARBON	47	5%	1/4W F
R215	1-249-401-11	CARBON	47	5%	1/4W F
R235	1-249-417-11	CARBON	1K	5%	1/4W F
R236	1-247-903-00	CARBON	1M	5%	1/4W
R252	1-249-401-11	CARBON	47	5%	1/4W F
R253	1-249-401-11	CARBON	47	5%	1/4W F
R255	1-249-401-11	CARBON	47	5%	1/4W F
R256	1-249-401-11	CARBON	47	5%	1/4W F
R298	1-249-429-11	CARBON	10K	5%	1/4W
R299	1-249-415-11	CARBON	680	5%	1/4W F
R311	1-249-429-11	CARBON	10K	5%	1/4W
R312	1-249-429-11	CARBON	10K	5%	1/4W
R313	1-249-429-11	CARBON	10K	5%	1/4W
R316	1-249-409-11	CARBON	220	5%	1/4W F
R322	1-249-401-11	CARBON	47	5%	1/4W F
R323	1-249-401-11	CARBON	47	5%	1/4W F
R324	1-249-401-11	CARBON	47	5%	1/4W F
R325	1-249-401-11	CARBON	47	5%	1/4W F
R340	1-247-895-00	CARBON	470K	5%	1/4W
R343	1-247-895-00	CARBON	470K	5%	1/4W
R344	1-249-437-11	CARBON	47K	5%	1/4W
R345	1-247-895-00	CARBON	470K	5%	1/4W
R346	1-247-895-00	CARBON	470K	5%	1/4W
R348	1-249-437-11	CARBON	47K	5%	1/4W
R350	1-249-417-11	CARBON	1K	5%	1/4W F
R405	1-247-903-00	CARBON	1M	5%	1/4W
R407	1-249-429-11	CARBON	10K	5%	1/4W
R408	1-249-429-11	CARBON	10K	5%	1/4W
R417	1-249-429-11	CARBON	10K	5%	1/4W
R418	1-249-429-11	CARBON	10K	5%	1/4W
R419	1-249-429-11	CARBON	10K	5%	1/4W

Ref. No.	Part No.	Description			Remark
R420	1-249-441-11	CARBON	100K	5%	1/4W
R431	1-249-429-11	CARBON	10K	5%	1/4W
R432	1-249-429-11	CARBON	10K	5%	1/4W
R433	1-249-429-11	CARBON	10K	5%	1/4W
R442	1-249-429-11	CARBON	10K	5%	1/4W
R443	1-249-429-11	CARBON	10K	5%	1/4W
R445	1-249-429-11	CARBON	10K	5%	1/4W
R446	1-249-429-11	CARBON	10K	5%	1/4W
R447	1-249-429-11	CARBON	10K	5%	1/4W
R448	1-249-429-11	CARBON	10K	5%	1/4W
R449	1-249-441-11	CARBON	100K	5%	1/4W
R452	1-249-441-11	CARBON	100K	5%	1/4W
R455	1-249-429-11	CARBON	10K	5%	1/4W
R460	1-249-429-11	CARBON	10K	5%	1/4W
R461	1-249-429-11	CARBON	10K	5%	1/4W
R462	1-249-429-11	CARBON	10K	5%	1/4W
R463	1-249-429-11	CARBON	10K	5%	1/4W
R491	1-249-425-11	CARBON	4.7K	5%	1/4W F
R492	1-249-429-11	CARBON	10K	5%	1/4W
R493	1-249-426-11	CARBON	5.6K	5%	1/4W
R494	1-249-393-11	CARBON	10	5%	1/4W F
R501	1-249-441-11	CARBON	100K	5%	1/4W
R509	1-249-429-11	CARBON	10K	5%	1/4W
R510	1-249-429-11	CARBON	10K	5%	1/4W
R513	1-249-410-11	CARBON	270	5%	1/4W F
R514	1-249-416-11	CARBON	820	5%	1/4W F
R515	1-249-429-11	CARBON	10K	5%	1/4W
R516	1-247-807-31	CARBON	100	5%	1/4W
R517	1-249-438-11	CARBON	56K	5%	1/4W
R518	1-247-891-00	CARBON	330K	5%	1/4W
R519	1-249-417-11	CARBON	1K	5%	1/4W F
R520	1-249-429-11	CARBON	10K	5%	1/4W
R533	1-249-441-11	CARBON	100K	5%	1/4W
R802	1-249-393-11	CARBON	10	5%	1/4W F
		< COMPOSITION CIRCUIT BLOCK >			
RB401	1-234-039-11	CIRCUIT BLOCK, COMPOSITION			
		< VIBRATOR >			
X201	1-579-314-11	VIBRATOR, CRYSTAL (22MHz)			
X402	1-767-778-21	VIBRATOR, CERAMIC (7MHz)			
**********					
*	A-4724-288-A	PANEL BOARD, COMPLETE (AEP,UK)			
		**********			
*	A-4724-509-A	PANEL BOARD, COMPLETE (US)			
		**********			
*	A-4724-251-A	PANEL BOARD, COMPLETE (SP)			
		**********			
*	1-690-880-31	LEAD (WITH CONNECTOR)			
	2-389-320-01	CUSHION			
*	4-983-462-01	HOLDER (FL)			
		< CAPACITOR >			
C371	1-162-294-31	CERAMIC	0.001uF	10%	50V

Ref. No.	Part No.	Description			Remark
C373	1-162-294-31	CERAMIC	0.001uF	10%	50V
C702	1-164-159-11	CERAMIC	0.1uF		50V
C703	1-162-294-31	CERAMIC	0.001uF	10%	50V
C704	1-162-294-31	CERAMIC	0.001uF	10%	50V
C705	1-162-294-31	CERAMIC	0.001uF	10%	50V
C706	1-162-294-31	CERAMIC	0.001uF	10%	50V
C707	1-162-294-31	CERAMIC	0.001uF	10%	50V
C708	1-162-306-11	CERAMIC	0.01uF	20%	16V
C709	1-124-589-11	ELECT	47uF	20%	16V
C710	1-162-215-31	CERAMIC	47PF	5%	50V
C716	1-164-159-11	CERAMIC	0.1uF		50V
C717	1-124-584-00	ELECT	100uF	20%	10V
C718	1-162-306-11	CERAMIC	0.01uF	20%	16V
C721	1-162-306-11	CERAMIC	0.01uF	20%	16V
C730	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
CN701	1-778-688-11	CONNECTOR, FFC/FPC 23P			
		< DIODE >			
D701	8-719-046-44	DIODE SEL5221S (STANDBY)			
D750	8-719-933-40	DIODE HZS6C2L			
		< FLUORESCENT INDICATOR >			
FL701	1-517-353-11	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC701	8-759-426-98	IC MSM9202-02GS-K			
IC702	8-749-013-92	IC GP1UC7X			
		< JACK >			
J701	1-750-925-11	JACK (SMALL TYPE)(PHONES)			
J702	1-784-295-11	JACK (SMALL TYPE)(CONTROL A1)			
		< COIL >			
L701	1-414-142-11	INDUCTOR	1uH		
L702	1-414-142-11	INDUCTOR	1uH		
L703	1-412-473-21	INDUCTOR	0uH		
		< TRANSISTOR >			
Q701	8-729-119-76	TRANSISTOR 2SA1175-HFE			
		< RESISTOR >			
R701	1-249-429-11	CARBON	10K	5%	1/4W
R702	1-249-429-11	CARBON	10K	5%	1/4W
R705	1-247-842-11	CARBON	3K	5%	1/4W
R706	1-249-421-11	CARBON	2.2K	5%	1/4W F
R707	1-249-429-11	CARBON	10K	5%	1/4W
R708	1-249-417-11	CARBON	1K	5%	1/4W F
R709	1-249-417-11	CARBON	1K	5%	1/4W F
R712	1-247-807-31	CARBON	100	5%	1/4W
R713	1-249-393-11	CARBON	10	5%	1/4W F
R714	1-249-393-11	CARBON	10	5%	1/4W F
R715	1-247-843-11	CARBON	3.3K	5%	1/4W
R716	1-249-425-11	CARBON	4.7K	5%	1/4W F

Ref. No.	Part No.	Description			Remark
R717	1-249-429-11	CARBON	10K	5%	1/4W
R721	1-247-807-31	CARBON	100	5%	1/4W
R722	1-247-807-31	CARBON	100	5%	1/4W
R723	1-247-807-31	CARBON	100	5%	1/4W
R724	1-247-807-31	CARBON	100	5%	1/4W
R741	1-249-401-11	CARBON	47	5%	1/4W F
R752	1-249-421-11	CARBON	2.2K	5%	1/4W F
R753	1-249-432-11	CARBON	18K	5%	1/4W
R754	1-249-437-11	CARBON	47K	5%	1/4W
R762	1-249-421-11	CARBON	2.2K	5%	1/4W F
R763	1-247-843-11	CARBON	3.3K	5%	1/4W
R764	1-249-431-11	CARBON	15K	5%	1/4W
R772	1-249-421-11	CARBON	2.2K	5%	1/4W F
R773	1-247-843-11	CARBON	3.3K	5%	1/4W
R774	1-249-425-11	CARBON	4.7K	5%	1/4W F
R791	1-247-807-31	CARBON	100	5%	1/4W
R792	1-249-429-11	CARBON	10K	5%	1/4W
R793	1-249-429-11	CARBON	10K	5%	1/4W
		< VARIABLE RESISTOR >			
RV701	1-225-579-11	RES, VAR, CARBON 1K/1K (PHONE LEVEL)			
		< SWITCH >			
S702	1-762-404-11	SWITCH, SLIDE (INPUT)			
S703	1-762-404-11	SWITCH, SLIDE (REC MODE)			
S704	1-771-047-11	SWITCH, SLIDE (TIMER)			
S751	1-762-875-21	SWITCH, KEYBOARD (⏏)			
S752	1-762-875-21	SWITCH, KEYBOARD (PLAYMODE)			
S753	1-762-875-21	SWITCH, KEYBOARD (DISPLAY/CHAR)			
S754	1-762-875-21	SWITCH, KEYBOARD (I/⏻)			
S761	1-762-875-21	SWITCH, KEYBOARD (EDIT/NO)			
S762	1-762-875-21	SWITCH, KEYBOARD (YES)			
S765	1-762-875-21	SWITCH, KEYBOARD (▷II)			
S771	1-762-875-21	SWITCH, KEYBOARD (●)			
S772	1-762-875-21	SWITCH, KEYBOARD (■)			
S773	1-762-875-21	SWITCH, KEYBOARD (▶▶)			
S774	1-762-875-21	SWITCH, KEYBOARD (◀◀)			

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*	1-661-774-11	SW BOARD	
		*********	
		< CONNECTOR >	
CN601	1-770-698-11	CONNECTOR, FFC/FPC 15P	
CN602	1-778-638-21	PIN, CONNECTOR (PC BOARD) 2P	
CN603	1-778-638-21	PIN, CONNECTOR (PC BOARD) 2P	
		< SWITCH >	
S681	1-572-467-61	SWITCH, PUSH (1 KEY)(LIMIT IN)	
S682	1-692-377-31	SWITCH, PUSH (1 KEY)(REFLECT)	
S683	1-692-847-21	SWITCH, PUSH (1 KEY)(PROTECT)	
S685	1-572-467-61	SWITCH, PUSH (1 KEY)(CHUCKING IN)	
S686	1-762-621-21	SWITCH, PUSH (1 KEY)(PACK OUT)	
S687	1-572-688-11	SWITCH, PUSH (1 KEY)(PB POSITION)	
S688	1-762-621-21	SWITCH, PUSH (1 KEY)(REC POSITION)	

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TRANS | VOLTAGE SELECTOR | VOLUME

Ref. No.	Part No.	Description			Remark
*	1-668-217-11	TRANS BOARD			
		**********			
	1-775-377-21	LEAD (WITH CONNECTOR)(US,AEP,UK)			
		< CAPACITOR >			
⚠C301	1-113-924-11	CERAMIC	0.0047uF	20%	250V
⚠C302	1-113-924-11	CERAMIC	0.0047uF	20%	250V
⚠C303	1-113-924-11	CERAMIC	0.0047uF	20%	250V (AEP,UK,SP)
⚠C304	1-113-924-11	CERAMIC	0.0047uF	20%	250V (SP)
C812	1-164-159-11	CERAMIC	0.1uF		50V (AEP,UK)
		< CONNECTOR >			
* CN301	1-580-230-31	PIN, CONNECTOR (PC BOARD) 2P			
CN306	1-564-523-11	PLUG, CONNECTOR 8P			
		< LINE FILTER >			
⚠LF301	1-424-485-11	FILTER, LINE			
		< TRANSFORMER >			
⚠TR001	1-431-253-21	TRANSFORMER, POWER (AEP,UK)			
⚠TR001	1-431-254-11	TRANSFORMER, POWER (SP)			

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*	1-670-450-11	VOLTAGE SELECTOR BOARD (AEP,UK,SP)			
		**********			
		< CONNECTOR >			
CN302	1-564-321-00	PIN, CONNECTOR 2P (AEP,UK)			
* CN302	1-564-687-11	PIN, CONNECTOR 3P (SP)			
		< SWITCH >			
⚠S301	1-771-473-11	SWITCH, POWER (VOLTAGE CHANGE) (MAIN POWER)(AEP,UK)			
⚠S301	1-771-474-11	SWITCH, POWER (VOLTAGE CHANGE) (VOLTAGE SELECTOR)(SP)			

****

*	1-668-216-11	VOLUME BOARD			
		**********			
		< CONNECTOR >			
CN702	1-564-722-11	PIN, CONNECTOR (SMALL TYPE) 6P			
		< VARIABLE RESISTOR >			
RV702	1-225-417-11	RES, VAR, CARBON 20K/20K (REC LEVEL)			

****

		MISCELLANEOUS
		**********
* 6	1-690-880-31	LEAD (WITH CONNECTOR)
10	1-782-265-11	WIRE (FLAT TYPE) (23 CORE)
52	1-782-263-11	WIRE (FLAT TYPE) (29 CORE)
53	1-782-264-11	WIRE (FLAT TYPE) (19 CORE)

Ref. No.	Part No.	Description	Remark
⚠58	1-558-945-21	CORD, POWER (POLAR, SPT-1) (US)	
⚠58	1-696-586-21	CORD, POWER (UK)	
⚠58	1-751-275-11	CORD, POWER (AEP,SP)	
⚠62	1-569-008-21	ADAPTOR, CONVERSION 2P (SP)	
63	1-775-377-21	LEAD (WITH CONNECTOR) (US,AEP,UK)	
206	1-660-966-11	PC BOARD, OP RALAY FLEXIBLE	
208	1-777-517-11	WIRE (FLAT TYPE) (15 CORE)	
⚠267	8-583-028-02	OPTICAL PICK-UP KMS-260A/J1N	
FL701	1-517-353-11	INDICATOR TUBE, FLUORESCENT	
HR901	1-500-396-11	HEAD, OVER WRITE	
M901	A-4672-135-A	MOTOR ASSY, SPINDLE	
M902	A-4672-133-A	MOTOR ASSY, SLED	
M903	A-4672-134-A	MOTOR ASSY, LOADING	
S701	1-475-657-11	ENCODER, ROTARY	
⚠TR001	1-431-252-21	TRANSFORMER, POWER (US)	
⚠TR001	1-431-253-21	TRANSFORMER, POWER (AEP,UK)	
⚠TR001	1-431-254-11	TRANSFORMER, POWER (SP)	

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		ACCESSORIES & PACKING MATERIALS
		**********
	1-475-850-11	REMOTE COMMANDER (RM-D23M)
	1-558-271-11	CORD, CONNECTION (AUDIO, 108cm)
	1-574-264-11	CORD, OPTICAL PLUG
	1-759-642-11	COMPACT DISK (DGRS-135)
	1-783-106-11	CORD, CONNECTION (CONTROL A1, 150cm)
	3-861-309-11	MANUAL, INSTRUCTION (ENGLISH,FRENCH,SPANISH)
	3-861-309-21	MANUAL, INSTRUCTION (PORTUGUESE,CHINESE)(AEP,SP)
	3-861-309-31	MANUAL, INSTRUCTION (GERMAN,DUTCH,SWEDISH,ITALIAN)(AEP)
	3-861-428-11	MANUAL, INSTRUCTION (FOR SOFTWARE)(ENGLISH,FRENCH,SPANISH)
	3-861-428-21	MANUAL, INSTRUCTION (FOR SOFTWARE) (PORTUGUESE,CHINESE)(AEP,SP)
	3-861-428-31	MANUAL, INSTRUCTION (FOR SOFTWARE) (GERMAN,DUTCH,SWEDISH,ITALIAN)(AEP)
	A-4406-082-A	CORD, CONNECTION (CAV-50C)
	4-983-537-11	COVER,BATTERY (FOR RM-D23M)

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		**********
		HARDWARE LIST
		**********
#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S
#2	7-685-645-79	SCREW +BVTP 3X6 TYPE2 N-S
#3	7-685-850-04	SCREW +BVTT 2X3 (S)
#4	7-685-851-04	SCREW +BVTT 2X4 (S)
#5	7-627-852-28	+P 1.7X3
#6	7-627-553-17	PRECISION SCREW +P 2X2 TYPE 3
#7	7-627-552-27	SCREW,PRECISION +P 1.7X2

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-922-739-12

Sony Corporation
Home A&V Products Company

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